

THE ASTROPHYSICAL JOURNAL

AUTHOR INDEX

PARTS 1 & 2, VOLUMES 408–410

1993 MAY 1 TO JUNE 20

- ABT, HELMUT A. Announcement: Additional Associate Editors. *Helmut A. Abt*. 408, 1, 83-B1 (1993)
- AITKEN, D. K. An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright*. 409, 404, 102-A8 (1993)
- AKESON, R. L. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer*. 409, 14, 97-C1 (1993)
- ALLAMANDOLA, LOUIS J. H₂ in Interstellar and Extragalactic Ices: Infrared Characteristics, Ultraviolet Production, and Implications. *Scott A. Sandford & Louis J. Allamandola*. 409, L65, 111-F1 (1993)
- ALLEN, RICHARD G. Optical and Hubble Space Telescope Ultraviolet Spectropolarimetry of 3C 273 and PG 1114+445. *Paul S. Smith, Gary D. Schmidt, & Richard G. Allen*. 409, 604, 106-D13 (1993)
- ALLEN, RONALD J. Detection of CO Emission from Massive Molecular Clouds in the Inner Disk of M31. *Ronald J. Allen & J. Lequeux*. 410, L15, 117-G7 (1993)
- ALLER, L. H. Fe III Emission Lines in the Optical Spectrum of the Planetary Nebula IC 4997. *F. P. Keenan, L. H. Aller, S. Hyung, E. S. Conlon, & G. A. Warren*. 410, 430, 117-D3 (1993)
- ALPAR, M. ALI. Postglitch Relaxation of the Vela Pulsar after Its First Eight Large Glitches: A Reevaluation with the Vortex Creep Model. *M. Ali Alpar, H. F. Chau, K. S. Cheng, & David Pines*. 409, 345, 101-D1 (1993)
- ALTNER, B. Ultraviolet Properties of Individual Hot Stars in Globular Cluster Cores. I. NGC 1904 (M79). *B. Altner & T. A. Matilsky*. 410, 116, 113-E8 (1993)
- AMARI, S. s-Process Ba Isotopic Compositions in Presolar SiC from the Murchison Meteorite. *C. A. Prombo, F. A. Podosek, S. Amari, & R. S. Lewis*. 410, 393, 117-A1 (1993)
- ANANTHARAMAIAH, K. R. VLA Observations of 1E 1740.7–2942: A Search for Radio Recombination Lines of Positronium. *K. R. Anantharamaiah, K. S. Dwarakanath, D. Morris, W. M. Goss, & V. Radhakrishnan*. 410, 110, 113-E1 (1993)
- ANDERSON, CHARLES H. Hierarchical Structure Analysis of Interstellar Clouds Using Nonorthogonal Wavelets. *William D. Langer, Robert W. Wilson, & Charles H. Anderson*. 408, L45, 89-C7 (1993)
- ANDERSON, J. D. Upper Limits for Gravitational Radiation from Supermassive Coalescing Binaries. *J. D. Anderson, J. W. Armstrong, & E. L. Lau*. 408, 287, 86-F4 (1993)
- ANDERSON, M. A. The Millimeter-Wave Spectrum of CaH ($X^2\Sigma^+$). *W. L. Barclay, Jr., M. A. Anderson, & L. M. Ziurys*. 408, L65, 89-F8 (1993)
- ANDERSON, MARTHA C. Spatial Spectral Index Variations in Galactic Shell Supernova Remnants G39.2–0.3 and G41.1–0.3. *Martha C. Anderson & Lawrence Rudnick*. 408, 514, 91-E9 (1993)
- ANDERSON, S. B. The Binary Pulsar PSR 1908+00 in NGC 6760. *W. T. S. Deich, J. Middleton, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan*. 410, L95, 126-A13 (1993)
- APARICIO, ANTONIO. The Interacting System NGC 7753–7752 (Arp 86). I. BVRI Photometry. *Eija Laurikainen, Heikki Salo, & Antonio Aparicio*. 410, 574, 120-G3 (1993)
- ARMSTRONG, J. W. Upper Limits for Gravitational Radiation from Supermassive Coalescing Binaries. *J. D. Anderson, J. W. Armstrong, & E. L. Lau*. 408, 287, 86-F4 (1993)
- ARNAUD, K. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- ARONS, NATHAN. Magnetic Field Topology in Pulsars. *Jonathan Arons*. 408, 160, 85-B1 (1993)
- ARRIBAS, S. The Circumnuclear Region of NGC 5728. *S. Arribas & E. Mediavilla*. 410, 552, 120-E5 (1993)
- ARTYMOWICZ, PAWEŁ. Star Trapping and Metallicity Enrichment in Quasars and Active Galactic Nuclei. *Paweł Artymowicz, D. N. C. Lin, & E. Joseph Wampler*. 409, 592, 106-C12 (1993)
- ARZOUMANIAN, Z. See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- ASAI, K. The Discovery of Pulsed Iron Line Emission from Centaurus X-3. *C. S. R. Day, F. Nagase, K. Asai, & T. Takeshima*. 408, 656, 93-D1 (1993)
- ASHE, GREGORY A. Modeling the Structure of H I in the Galactic Disk. *Joel N. Bregman, Daniel D. Kelson, & Gregory A. Ashe*. 409, 682, 107-D9 (1993)
- ATWOOD, BRUCE. Imaging Spectrophotometry of the Orion Nebula Core. I. Emission-Line Mapping and Physical Conditions: Erratum. *Richard W. Pogge, J. Michael Owen, & Bruce Atwood*. 408, 758, 94-E9 (1993) (Orig. paper in 399, 147, 197-A9 (1992))
- AUGUSTEIJN, THOMAS. Optical and X-Ray Observations of the Low-Mass X-Ray Binary EXO 0748–676. *Brian Thomas, Robin Corbet, Thomas Augusteijn, Paul Callanan, & Alan P. Smale*. 408, 651, 93-C7 (1993)
- AWAKI, H. X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai*. 409, 155, 98-G9 (1993)
- BAAN, WILLEM A. 4–1–30 E Methanol Emission in G1.6–0.025. *Aubrey D. Haschick & Willem A. Baan*. 410, 663, 121-G12 (1993)
- BAHCALL, J. N. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- BAHCALL, JOHN N. g-Modes and the Solar Neutrino Problem. *John N. Bahcall & Pawan Kumar*. 409, L73, 111-G1 (1993)
- BAHCALL, N. A. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- BAHCALL, NETA A. Redshift Space Clustering of Galaxies and Cold Dark Matter Model. *Neta A. Bahcall, Renyue Cen, & Mirt Gramann*. 408, L77, 95-B7 (1993)
- BAI, T. Evidence for a Fundamental Period of the Sun and Its Relation to the 154 Day Complex of Periodicities. *T. Bai & P. A. Sturrock*. 409, 476, 102-G8 (1993)
- BAILYN, C. D. A Supersoft Variable Low-Luminosity X-Ray Source in the Globular Cluster M3. *P. Hertz, J. E. Grindlay, & C. D. Bailyn*. 410, L87, 126-A1 (1993)
- BAILYN, CHARLES D. Discovery of Multiple Low-Luminosity X-Ray Sources in NGC 6397. *Adrienne M. Cool, Jonathan E. Grindlay, Martin Krockenberger, & Charles D. Bailyn*. 410, L103, 126-B11 (1993)
- BALDWIN, J. A. The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne*. 410, 534, 120-C11 (1993)
- BALDWIN, JACK A. Double-peaked Broad Line Emission from the LINER Nucleus of NGC 1097. *Thaisa Storchi-Bergmann, Jack A. Baldwin, & Andrew S. Wilson*. 410, L11, 117-G1 (1993)
- BALLESTER, J. L. Oscillations of a Quiescent Solar Prominence Embedded in a Hot Corona. *R. Oliver, J. L. Ballester, A. W. Hood, & E. R. Priest*. 409, 809, 109-B12 (1993)

- BALLY, JOHN. Interstellar Matter near the Pleiades. IV. The Wake of the Pleiades through the Interstellar Medium in Taurus. *Richard E. White & John Bally*. 409, 234, 99-G13 (1993)
- BAO, G. Features of the Fluorescent Iron Line from Highly Inclined Disks: Some Possible Examples for NGC 6814. *G. Bao*. 409, L41, 111-C1 (1993)
- BARBUY, B. Field Color-Magnitude Diagram Analysis along the Bulge Major Axis. *S. Ortolani, E. Bica, & B. Barbuy*. 408, L29, 89-A8 (1993)
- BARCLAY, W. L., JR. The Millimeter-Wave Spectrum of CaH ($X^2\Sigma^+$). *W. L. Barclay, Jr., M. A. Anderson, & L. M. Ziurys*. 408, L65, 89-F8 (1993)
- BARING, MATTHEW G. The Injection and Acceleration of Particles in Oblique Shocks: A Unified Monte Carlo Description. *Matthew G. Baring, Donald C. Ellison, & Frank C. Jones*. 409, 327, 101-B8 (1993)
- BARNES, THOMAS G., III. See MICHALITSIANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- BARON, E. On the Stellar Progenitor of the Type Ib Supernova 1984L. *E. Baron, Timothy R. Young, & David Branch*. 409, 417, 102-B10 (1993)
- BARR, P. A Spectral Study of Four X-Ray-selected BL Lacertae Objects with EXOSAT. *R. M. Sambruna, P. Barr, L. Maraschi, G. Tagliaferri, & A. Treves*. 408, 452, 90-G1 (1993)
- BARSONY, M. Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. *M. Barsony, N. Z. Scoville, & C. J. Chandler*. 409, 275, 100-E4 (1993)
- BARTEL, N. Angular Broadening of Pulsars and the Distribution of Interstellar Plasma Fluctuations. *C. R. Gwinn, N. Bartel, & J. M. Cordes*. 410, 673, 122-A13 (1993)
- BAZAN, GRANT. Energy Generation in Convective Shells of Low-Mass, Low-Metallicity Asymptotic Giant Branch Stars. *Grant Bazan & John C. Lattanzio*. 409, 762, 108-E6 (1993)
- BECHTOLD, J. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- BECKWITH, S. H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith*. 408, L105, 95-F1 (1993)
- BECKWITH, S. V. W. Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. *D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith*. 408, L93, 95-D7 (1993)
- BEICHMAN, C. A. High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman*. 409, L5, 104-B1 (1993)
- BEIERSDORFER, P. High-Resolution Measurements, Line Identification, and Spectral Modeling of K α Transitions in Fe XVIII-Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn*. 409, 846, 109-F6 (1993)
- BELL, KENNETH L. Effective Collision Strengths for O II. *Brendan M. McLaughlin & Kenneth L. Bell*. 408, 753, 94-E3 (1993)
- BENDINELLI, O. The First Detection of a Collapsed Core Globular Cluster in M31. *O. Bendinelli, C. Cacciari, S. Djorgovski, L. Federici, F. R. Ferraro, F. Fusi Pecci, G. Parmeggiani, N. Weir, & F. Zavatti*. 409, L17, 104-C7 (1993)
- BENSADOUN, M. Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky*. 409, 1, 97-B1 (1993)
- BENZ, WILLY. Three-dimensional Simulations of Protostellar Jets. *Elisabete M. de Gouveia Dal Pino & Willy Benz*. 410, 686, 122-B13 (1993)
- BERGESON, S. D. Radiative Lifetimes, Branching Ratios, and Absolute Transition Probabilities in Cr II and Zn II. *S. D. Bergeson & J. E. Lawler*. 408, 382, 88-A3 (1993)
- BERSANELLI, M. Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky*. 409, 1, 97-B1 (1993)
- BERTRAM, R. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- BERTSCH, D. L. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- BHATIA, A. K. The Optically Thin C III Spectrum: Line and Multiplet Intensities. *A. K. Bhatia & S. O. Kastner*. 408, 744, 94-D7 (1993)
- BIANCHI, L. Hubble Space Telescope Spectra of the Phase-modulated Wind in the SMC O+WR Binary R31. *J. B. Hutchings, L. Bianchi, & S. C. Morris*. 410, 803, 123-F10 (1993)
- BICA, E. Field Color-Magnitude Diagram Analysis along the Bulge Major Axis. *S. Ortolani, E. Bica, & B. Barbuy*. 408, L29, 89-A8 (1993)
- BIAOUI, A. Objective Detection of Voids and High-Density Structures in the First CfA Redshift Survey Slice. *E. Slezak, V. de Lapparent, & A. Bijaoui*. 409, 517, 105-D1 (1993)
- BILDSTEN, LARS. Helium Destruction and Gamma-Ray Line Emission in Accreting Neutron Stars. *Lars Bildsten, Edwin E. Salpeter, & Ira Wasserman*. 408, 615, 92-G9 (1993)
- BINGHAM, R. Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer*. 409, 465, 102-F9 (1993)
- BITTER, M. High-Resolution Measurements, Line Identification, and Spectral Modeling of K α Transitions in Fe XVIII-Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn*. 409, 846, 109-F6 (1993)
- BJORKMAN, J. E. Equatorial Disk Formation around Rotating Stars Due to Ram Pressure Confinement by the Stellar Wind. *J. E. Bjorkman & J. P. Cassinelli*. 409, 429, 102-C10 (1993)
- BLAIR, WILLIAM P. Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance*. 408, L97, 95-E3 (1993)
- BLUMENTHAL, GEORGE R. Significant Cluster Correlations at 30 h⁻¹ Mpc: Can Standard Models Be Ruled Out? *Scot S. Olivier, Joel R. Primack, George R. Blumenthal, & Avishai Dekel*. 408, 17, 83-C7 (1993)
- BOCHKAREV, N. G. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- BOCK, J. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude. *J. Bock, V. V. Hristov, M. Kawada, H. Matsuhara, T. Matsumoto, S. Matsura, P. D. Maukopf, P. L. Richards, M. Tanaka, & A. E. Lange*. 410, L115, 126-D1 (1993)
- BÖHM, K. H. High-Resolution Long-Slit Spectral Imaging of the Mass Outflows in the Immediate Vicinity of DG Tauri. *J. Solf & K. H. Böhm*. 410, L31, 118-F13 (1993)
- BOGGESE, A. The Galactic Halo and Local Intergalactic Medium toward PKS 2155-304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo*. 409, 199, 99-D6 (1993)
- BOLDT, E. A. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- BOLTE, MICHAEL. Canada-France-Hawaii Telescope Observations of Globular Cluster Cores: Blue Straggler Stars in M3 (NGC 5272, GC 1339+286). *Michael Bolte, James E. Hesser, & Peter B. Stetson*. 408, L89, 95-C11 (1993)
- BOOKBINDER, JAY A. Stellar Coronae at the End of the Main Sequence: A ROSAT Survey of the Late M Dwarfs. *Thomas A.*

- Fleming, Mark S. Giampapa, J. H. M. M. Schmitt, & Jay A. Bookbinder. 410, 387, 116-G8 (1993)
- BORGWALD, J. M. η Carinae: A New Model. *J. M. Borgwald & M. W. Friedlander*. 408, 230, 86-A3 (1993)
- BOROSON, T. A. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- BOS, BRENT J. The OH Distribution in Cometary Atmospheres: A Collisional Monte Carlo Model for Heavy Species. *Michael R. Combi, Brent J. Bos, & William H. Smyth*. 408, 668, 93-E1 (1993)
- BOSS, ALAN P. Collapse and Fragmentation of Molecular Cloud Cores. I. Moderately Centrally Condensed Cores. *Alan P. Boss*. 410, 157, 114-B1 (1993)
- BOTHUN, G. D. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer*. 409, 14, 97-C1 (1993)
- BOWYER, STUART. The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupois, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine*. 410, L119, 126-D7 (1993)
- BOYLE, R. J. High-Resolution Mid-Infrared Spectra of Co II, Ni I, and Fe II in SN 1987A. *D. E. Jennings, R. J. Boyle, G. R. Wiedemann, & S. H. Moseley*. 408, 277, 86-E5 (1993)
- BOYNTON, P. E. Discovery of Orbital Decay in SMC X-1. *A. Levine, S. Rappaport, J. E. Deeter, P. E. Boynton, & F. Nagase*. 410, 328, 116-B8 (1993)
- BRAATZ, J. A. High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman*. 409, L5, 104-B1 (1993)
- BRAINERD, J. J. The Signature of the Cosmological Redshift in Population Studies of Gamma-Ray Burst Spectra. *J. J. Brainerd*. 410, 507, 120-A5 (1993)
- BRANCH, DAVID. On the Stellar Progenitor of the Type Ib Supernova 1984L. *E. Baron, Timothy R. Young, & David Branch*. 409, 417, 102-B10 (1993)
- BRANDENBURG, AXEL. Models for the Magnetic Field of M81. *David Moss, Axel Brandenburg, Karl Johan Donner, & Magnus Thomasson*. 409, 179, 99-B10 (1993)
- BREGMAN, JESSE. Spectral Imaging of the 3.3 and 11.3 Micron Emission Bands in NGC 1333: Discovery of Spatially Separate Band Emissions. *Jesse Bregman, David Rank, Scott A. Sandford, & Pasquale Temi*. 410, 668, 122-A5 (1993)
- BREGMAN, JOEL N. Modeling the Structure of H I in the Galactic Disk. *Joel N. Bregman, Daniel D. Kelson, & Gregory A. Ashe*. 409, 682, 107-D9 (1993)
- BREKKE, P. Observed Redshifts in O V and Downflows in the Solar Transition Region. *P. Brekke*. 408, 735, 94-C11 (1993)
- BRINKS, ELIAS. New 325 MHz Observations of H II Galaxies: The Mechanisms That Shape the Unusual Radio Spectra. *Hans-Jörg Deeg, Elias Brinks, Neb Duric, Uli Klein, & Evan Skillman*. 410, 626, 121-D13 (1993)
- BROCATO, ENZO. Theoretical Models for Massive Stars in Young Magellanic Cloud Stellar Clusters. *Enzo Brocato & Vittorio Castellani*. 410, 99, 113-D1 (1993)
- BRODSKY, M. Asymptotic Theory of Intermediate- and High-Degree Solar Acoustic Oscillations. *M. Brodsky & S. V. Vorontsov*. 409, 455, 102-E11 (1993)
- BROOKSHAW, LEIGH. Wind-driven Angular Momentum Loss in Binary Systems. I. Ballistic Case. *Leigh Brookshaw & Marco Tavani*. 410, 719, 122-F6 (1993)
- BROTHERTON, M. S. The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne*. 410, 534, 120-C11 (1993)
- BROWN, LAWRENCE E. Diffuse Gamma-Ray Emission from Pulsars in the Large Magellanic Cloud. *Dieter H. Hartmann, Lawrence E. Brown, & Neil Schnepf*. 408, L13, 88-F8 (1993)
- BROWNE, I. W. A. The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne*. 410, 534, 120-C11 (1993)
- BRUENN, STEPHEN W. Stellar Core Collapse: A Boltzmann Treatment of Neutrino-Electron Scattering. *Anthony Mezzacappa & Stephen W. Bruenn*. 410, 740, 123-A7 (1993)
- BRUHWEILER, FREDERICK C. The Galactic Halo and Local Inter-galactic Medium toward PKS 2155-304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo*. 409, 199, 99-D6 (1993)
- BURBIDGE, G. A Quasi-Steady State Cosmological Model with Creation of Matter. *F. Hoyle, G. Burbidge, & J. V. Narlikar*. 410, 437, 119-B7 (1993)
- BUSSO, M. Carbon Stars and Isotopic Ba Anomalies in Meteoritic SiC Grains. *R. Gallino, C. M. Raiteri, & M. Busso*. 410, 400, 117-A10 (1993)
- BUZZONI, ALBERTO. Galaxy Colors in Distant Clusters as a Test for the World Model. *Alberto Buzzoni, Guido Chincarini, & Emilio Molinari*. 410, 499, 119-G9 (1993)
- CACCIARI, C. See BENDINELLI, O., et al. The First Detection of a Collapsed Core Globular Cluster in M31.
- CAIRNS, I. H. Dynamics of Langmuir and Ion-Sound Waves in Type III Solar Radio Sources. *P. A. Robinson, A. J. Willes, & I. H. Cairns*. 408, 720, 94-B9 (1993)
- CALLANAN, PAUL. Optical and X-Ray Observations of the Low-Mass X-Ray Binary EXO 0748-676. *Brian Thomas, Robin Corbet, Thomas Augusteijn, Paul Callanan, & Alan P. Smale*. 408, 651, 93-C7 (1993)
- CALVANI, M. The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston*. 410, 56, 112-G4 (1993)
- CAMILO, F. A New Binary Millisecond Pulsar. *R. S. Foster, A. Wolszczan, & F. Camilo*. 410, L91, 126-A7 (1993)
- CANTÓ, JORGE. A Flattened Cloud Core in NGC 2024. *Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó*. 408, 565, 92-C1 (1993)
- From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. *José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó*. 410, 202, 114-F1 (1993)
- CANUTO, V. M. Cosmic Turbulence Revisited. *I. Goldman & V. M. Canuto*. 409, 495, 105-B1 (1993)
- CARONE, T. E. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- CARRUTHERS, GEORGE R. Far-Ultraviolet Stellar Photometry: A Field in Monoceros. *Edward G. Schmidt & George R. Carruthers*. 408, 484, 91-C1 (1993)
- CASELLI, P. Chemical Differentiation between Star-forming Regions: The Orion Hot Core and Compact Ridge. *P. Caselli, T. I. Hasegawa, & Eric Herbst*. 408, 548, 92-A11 (1993)
- CASERTANO, STEFANO. The Hyades Cluster-Supercluster Connection: Evidence for a Local Concentration of Dark Matter. *Stefano Casertano, Icko Iben, Jr., & Aaron Shiels*. 410, 90, 113-C5 (1993)
- CASSINELLI, J. P. Equatorial Disk Formation around Rotating Stars Due to Ram Pressure Confinement by the Stellar Wind. *J. E. Bjorkman & J. P. Cassinelli*. 409, 429, 102-C10 (1993)
- CASTELLANI, VITTORIO. Theoretical Models for Massive Stars in Young Magellanic Cloud Stellar Clusters. *Enzo Brocato & Vittorio Castellani*. 410, 99, 113-D1 (1993)
- CECIL, GERALD. The Bow Shock and Mach Disk of HH 111V. *Jon A. Morse, Steve Heathcote, Gerald Cecil, Patrick Harigan, & John C. Raymond*. 410, 764, 123-C5 (1993)
- CEN, RENYUE. The Cosmic Mach Number: Direct Comparisons of Observations and Models. *Michael A. Strauss, Renyue Cen, & Jeremiah P. Ostriker*. 408, 389, 90-B1 (1993)
- Redshift Space Clustering of Galaxies and Cold Dark Matter Model. *Neta A. Bahcall, Renyue Cen, & Mirt Gramann*. 408, L77, 95-B7 (1993)
- CHANDLER, C. J. Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. *M. Barsony, N. Z. Scoville, & C. J. Chandler*. 409, 275, 100-E4 (1993)

- CHANG, KYONGAE. The Velocity Dispersion of the Caustic Network Due to Random Motion of Individual Stars in the Lensing Galaxy. *Tomislav Kundić, Hans J. Witt, & Kyongae Chang*. 409, 537, 105-E13 (1993)
- CHAU, H. F. Magnetic Field Decay from the Core of Neutron Stars: Effects of Interpinning of $^3\text{P}_2$ Neutron Superfluid and $^1\text{S}_0$ Proton Superconducting Fluid. *K. Y. Ding, K. S. Cheng, & H. F. Chau*. 408, 167, 85-B11 (1993)
- Postglitch Relaxation of the Vela Pulsar after Its First Eight Large Glitches: A Reevaluation with the Vortex Creep Model. *M. Ali Alpar, H. F. Chau, K. S. Cheng, & David Pines*. 409, 345, 101-D1 (1993)
- CHAYER, PIERRE. The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupois, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine*. 410, L119, 126-D7 (1993)
- CHEN, HAIQI. Dynamics of the Envelopes of Be Stars and Shell Stars in the Equatorial Plane: A Potential Similarity and Difference Based upon the Continuous Energy Distribution. *J. M. Marlborough, Haiqi Chen, & L. B. F. M. Waters*. 408, 646, 93-C1 (1993)
- CHEN, KAIYOU. Origin and Radio Pulse Properties of Millisecond Pulsars. *Kaiyou Chen & Malvin Ruderman*. 408, 179, 85-C12 (1993)
- Low-Mass X-Ray Binaries and Millisecond Pulsars in Globular Clusters. *Kaiyou Chen, John Middleditch, & Malvin Ruderman*. 408, L17, 88-G1 (1993)
- CHEN, W. P. Ice Grains in the Corona Australis Molecular Cloud. *W. P. Chen & J. A. Graham*. 409, 319, 101-A11 (1993)
- CHEN, WAN. The Secondary Maxima in Black Hole X-Ray Nova Light Curves: Clues toward a Complete Picture. *Wan Chen, Mario Livio, & Neil Gehrels*. 408, L5, 88-E8 (1993)
- CHENG, ED. Cross-Correlation between the 170 GHz Survey Map and the COBE Differential Microwave Radiometer First-Year Maps. *Ken Ganga, Ed Cheng, Stephan Meyer, & Lyman Page*. 410, L57, 125-E1 (1993)
- CHENG, K. S. Magnetic Field Decay from the Core of Neutron Stars: Effects of Interpinning of $^3\text{P}_2$ Neutron Superfluid and $^1\text{S}_0$ Proton Superconducting Fluid. *K. Y. Ding, K. S. Cheng, & H. F. Chau*. 408, 167, 85-B11 (1993)
- Postglitch Relaxation of the Vela Pulsar after Its First Eight Large Glitches: A Reevaluation with the Vortex Creep Model. *M. Ali Alpar, H. F. Chau, K. S. Cheng, & David Pines*. 409, 345, 101-D1 (1993)
- A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung*. 410, 309, 115-G12 (1993)
- CHERCHNEFF, ISABELLE. The Formation of Cyanopolyne Molecules in IRC +10216. *Isabelle Cherchneff, Alfred E. Glassgold, & Gary A. Mamon*. 410, 188, 114-D12 (1993)
- CHIANG, J. See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- CHIAR, J. E. An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright*. 409, 404, 102-A8 (1993)
- CHIN, CHAO-WEN. Dynamical Instability as the Cause of the Massive Outbursts in η Carinae and Other Luminous Blue Variables. *Richard B. Stothers & Chao-wen Chin*. 408, L85, 95-C5 (1993)
- CHINCARINI, GUIDO. Galaxy Colors in Distant Clusters as a Test for the World Model. *Alberto Buzzoni, Guido Chincarini, & Emilio Molinari*. 410, 499, 119-G9 (1993)
- CHIUDERI DRAGO, F. Flaring and Quiescent Radio Emission of UX Arietis: A Time-dependent Model. *F. Chiuderi Drago & E. Franciosini*. 410, 301, 115-G3 (1993)
- CHUN, E. On the Thermal Stability of a Radiating Plasma Subject to Nonlocal Thermal Conduction. I. Linear Analysis. *E. Chun & R. Rosner*. 408, 678, 93-F1 (1993)
- CLAMPIN, MARK. Coronagraphic Imaging of the Bipolar Nebula around the Luminous Blue Variable R127. *Mark Clampin, Antonella Nota, David A. Golimowski, Claus Leitherer, & Samuel T. Durrance*. 410, L35, 118-C5 (1993)
- CLAPP, A. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.°5 Scale near the Star μ Pegasi.
- CLAYTON, GEOFFREY C. A New Luminous Blue Variable: R143 in 30 Doradus. *Joel Wm. Parker, Geoffrey C. Clayton, Cláudia Winge, & Peter S. Conti*. 409, 770, 108-F3 (1993)
- CLEGG, ANDREW W. Discontinuities in the Dynamic Spectrum of the Pulsar 0823+26. *Andrew W. Clegg, Ralph L. Fiedler, & James M. Cordes*. 409, 691, 107-E13 (1993)
- CLEMENS, DAN P. Near-Infrared Discovery of the L810 Nebula Illuminator. *João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke*. 408, L101, 95-E9 (1993)
- CLEMENT, CHRISTINE M. A Provisional RR Lyrae Distance Scale. *Norman R. Simon & Christine M. Clement*. 410, 526, 120-C1 (1993)
- COHEN, E. A. Rotational Spectra of the $X^2\Sigma^+$ States of CaH and CaD. *C. I. Frum, J. J. Oh, E. A. Cohen, & H. M. Pickett*. 408, L61, 89-F1 (1993)
- COLE, JAMES. The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- COMBI, MICHAEL R. The OH Distribution in Cometary Atmospheres: A Collisional Monte Carlo Model for Heavy Species. *Michael R. Combi, Brent J. Bos, & William H. Smyth*. 408, 668, 93-E1 (1993)
- P/Halley: Effects of Time-dependent Production Rates on Spatial Emission Profiles. *Michael R. Combi & Uwe Fink*. 409, 790, 109-A1 (1993)
- COMORETTO, G. VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle*. 408, 81, 84-B4 (1993)
- VLBI Observations of a Complete Sample of Radio Galaxies. III. The Two-sided Milliarcsecond Structure of 3C 338. *L. Feretti, G. Comoretto, G. Giovannini, T. Venturi, & A. E. Wehrle*. 408, 446, 90-F7 (1993)
- CONLON, E. S. LSIV -12°11': A Candidate Halo Proto-Planetary Nebula. *E. S. Conlon, P. L. Dufton, R. J. H. McCauley, & F. P. Keenan*. 408, 593, 92-E11 (1993)
- The Ratio of Optical-to-Infrared Emission Line Strengths in Ar III as Electron Density Diagnostics for Planetary Nebulae. *F. P. Keenan & E. S. Conlon*. 410, 426, 117-C12 (1993)
- Fe III Emission Lines in the Optical Spectrum of the Planetary Nebula IC 4997. *F. P. Keenan, L. H. Aller, S. Hyung, E. S. Conlon, & G. A. Warren*. 410, 430, 117-D3 (1993)
- CONTI, PETER S. A New Luminous Blue Variable: R143 in 30 Doradus. *Joel Wm. Parker, Geoffrey C. Clayton, Cláudia Winge, & Peter S. Conti*. 409, 770, 108-F3 (1993)
- COOK, WALTER R. An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7-2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone*. 408, 507, 91-E7 (1993)
- COOL, ADRIENNE M. Discovery of Multiple Low-Luminosity X-Ray Sources in NGC 6397. *Adrienne M. Cool, Jonathan E. Grindlay, Martin Krockenberger, & Charles D. Bailyn*. 410, L103, 126-B11 (1993)
- CORBET, ROBIN. Optical and X-Ray Observations of the Low-Mass X-Ray Binary EXO 0748-676. *Brian Thomas, Robin Corbet, Thomas Augusteijn, Paul Callanan, & Alan P. Smale*. 408, 651, 93-C7 (1993)
- CORDES, J. M. Angular Broadening of Pulsars and the Distribution of Interstellar Plasma Fluctuations. *C. R. Gwinn, N. Bartel, & J. M. Cordes*. 410, 673, 122-A13 (1993)
- CORDES, JAMES M. Discontinuities in the Dynamic Spectrum of the Pulsar 0823+26. *Andrew W. Clegg, Ralph L. Fiedler, & James M. Cordes*. 409, 691, 107-E13 (1993)
- CORNWELL, T. J. Imaging with Ultra-Resolution in the Presence of Strong Scattering. *T. J. Cornwell & Ramesh Narayan*. 408, L68, 89-G1 (1993)
- COYNE, G. V., S.J. The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. *V. Piroola, P. Hakala, & G. V. Coyne, S.J.* 410, L107, 126-C3 (1993)

- CRAWFORD, DAVID F. A Static Stable Universe. *David F. Crawford*. 410, 488, 119-F9 (1993)
- CRIVELLARI, L. An Implicit Integral Method to Solve Selected Radiative Transfer Problems. I. Non-LTE Line Formation. *E. Simonneau & L. Crivellari*. 409, 830, 109-D12 (1993)
- CUNTZ, M. Chromospheric Heating by Acoustic Shocks: A Confrontation of GHRS Observations of α Tauri (K5 III) with Ab Initio Calculations. *P. G. Judge & M. Cuntz*. 409, 776, 108-F13 (1993)
- DA COSTA, G. S. The Age of the Large Magellanic Cloud Cluster NGC 2031. *J. R. Mould, D. A. Xystus, & G. S. Da Costa*. 408, 108, 84-D8 (1993)
- DA COSTA, L. NICOLACI. Void Evolution and the Large-Scale Structure. *John Dubinski, L. Nicolaci da Costa, D. S. Goldwirth, M. Lecar, & T. Piran*. 410, 458, 119-D1 (1993)
- D'AMICO, N. A Young, Glitching Pulsar near the Direction of W28. *V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar*. 409, L57, 111-E1 (1993)
- DAVID, L. Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian*. 410, 21, 112-D1 (1993)
- DAVIDGE, T. J. Imaging of Fields in the Inner Halo and Outer Disk of M31. *T. J. Davidge*. 409, 190, 99-C8 (1993)
- DAVIDSEN, ARTHUR F. The Hot Stellar Component in Elliptical Galaxies and Spiral Bulges. I. The Far-Ultraviolet Spectrum of the Bulge of M31. *Henry C. Ferguson & Arthur F. Davidsen*. 408, 92, 84-C4 (1993)
- Extreme Ultraviolet Observations of HZ 43 and the Local H/H Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman*. 408, L41, 89-C1 (1993)
- DAVIES, MELVYN B. Tidal Disruptions by Supermassive Black Holes: Hydrodynamic Evolution of Stars on a Schwarzschild Background. *Pablo Laguna, Warner A. Miller, Wojciech H. Zurek, & Melvyn B. Davies*. 410, L83, 125-G9 (1993)
- DAVIS, SUMNER P. On the Carrier of the Band at 700 Nanometers in the Iron Hydride Spectrum. *John G. Phillips & Sumner P. Davis*. 409, 860, 109-G9 (1993)
- DAWSON, J. M. Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer*. 409, 465, 102-F9 (1993)
- DAY, C. S. R. The Discovery of Pulsed Iron Line Emission from Centaurus X-3. *C. S. R. Day, F. Nagase, K. Asai, & T. Takeshima*. 408, 656, 93-D1 (1993)
- DE AMICI, G. Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky*. 409, 1, 97-B1 (1993)
- DEBRUNNER, H. Solar Neutron and Proton Production during the 1990 May 24 Cosmic-Ray Flare Increases. *H. Debrunner, J. A. Lockwood, & J. M. Ryan*. 409, 822, 109-D1 (1993)
- DEEG, HANS-JÖRG. New 325 MHz Observations of H II Galaxies: The Mechanisms That Shape the Unusual Radio Spectra. *Hans-Jörg Deeg, Elias Brinks, Neb Duric, Uli Klein, & Evan Skillman*. 410, 626, 121-D13 (1993)
- DEETER, J. E. Discovery of Orbital Decay in SMC X-1. *A. Levine, S. Rappaport, J. E. Deeter, P. E. Boynton, & F. Nagase*. 410, 328, 116-B8 (1993)
- DE FREES, D. J. Theoretical Infrared Spectra of Some Model Polycyclic Aromatic Hydrocarbons: Effect of Ionization. *D. J. De Frees, M. D. Miller, D. Talbi, F. Pauzat, & Y. Ellinger*. 408, 530, 91-G5 (1993)
- DE GASPERIS, GIANCARLO. Tilted Cold Dark Matter Models Confront the Cosmic Microwave Background and the Galaxy Peculiar Velocity Field. *Pio Francesco Muciaccia, Simona Mei, Giancarlo de Gasperis, & Nicola Vittorio*. 410, L61, 125-E7 (1993)
- DE GOUVEIA DAL PINO, ELISABETE M. Three-dimensional Simulations of Protostellar Jets. *Elisabete M. de Gouveia Dal Pino & Willy Benz*. 410, 686, 122-B13 (1993)
- DEICH, W. T. S. The Binary Pulsar PSR 1908+00 in NGC 6760. *W. T. S. Deich, J. Middleton, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan*. 410, L95, 126-A13 (1993)
- DEKEL, AVISHAI. Significant Cluster Correlations at 30 h^{-1} Mpc: Can Standard Models Be Ruled Out? *Scot S. Olivier, Joel R. Primack, George R. Blumenthal, & Avishai Dekel*. 408, 17, 83-C7 (1993)
- DE LAPPARENT, V. Objective Detection of Voids and High-Density Structures in the First CfA Redshift Survey Slice. *E. Slezak, V. de Lapparent, & A. Bijaoui*. 409, 517, 105-D1 (1993)
- DE MELLO RABAÇA, DUILIA F. Searching for a Far-Infrared Enhancement in Compact Groups of Galaxies. *Jack W. Sulentic & Duilia F. De Mello Rabaça*. 410, 520, 120-B8 (1993)
- DENT, W. R. F. Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Mathews, R. Wade, & W. D. Duncan*. 410, 650, 121-F11 (1993)
- DEVLIN, M. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5° Scale near the Star μ Pegasi.
- DICKINSON, MARK. An Optically Luminous Radio Galaxy at $z = 3.22$ and the K-z Diagram at High Redshift. *Stephen A. Eales, Steve Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy*. 409, 578, 106-B7 (1993)
- DIETRICH, M. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548. *M. Dietrich, W. Kollatschny, B. M. Peterson, J. Bechtold, R. Berram, N. G. Bochkarev, T. A. Boroson, T. E. Carone, M. Elvis, A. V. Filippenko, C. M. Gaskell, J. P. Huchra, J. B. Hutchings, A. P. Koratkar, K. T. Korista, N. J. Laor, G. M. MacAlpine, M. A. Malkan, C. Mendes de Oliveira, H. Netzer, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, E. I. Rosenblatt, A. I. Shapovalova, J. C. Shields, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, S. Veilleux, R. M. Wagner, B. J. Wilkes, B. J. Wills, & D. Wills*. 408, 416, 90-D1 (1993)
- DING, K. Y. Magnetic Field Decay from the Core of Neutron Stars: Effects of Interpinning of ${}^3\text{P}_2$ Neutron Superfluid and ${}^1\text{S}_0$ Proton Superconducting Fluid. *K. Y. Ding, K. S. Cheng, & H. F. Chau*. 408, 167, 85-B11 (1993)
- DINGUS, B. L. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- DJORGovski, S. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- Molecular Gas in Powerful Radio Galaxies Detected by IRAS. *J. M. Mazzarella, J. R. Graham, D. B. Sanders, & S. Djorgovski*. 409, 170, 99-A13 (1993)
- See BENDINELLI, O., et al. The First Detection of a Collapsed Core Globular Cluster in M31.
- DONE, C. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- DONNER, KARL JOHAN. Models for the Magnetic Field of M81. *David Moss, Axel Brandenburg, Karl Johan Donner, & Magnus Thomasson*. 409, 179, 99-B10 (1993)
- DORMAN, BEN. On Partial Mixing Zones in Horizontal-Branch Stellar Cores. *Ben Dorman & Robert T. Rood*. 409, 387, 101-G3 (1993)
- DOS SANTOS, L. C. Mass Loss from Wolf-Rayet Stars Due to Radiation Pressure and Alfvén Waves. *L. C. dos Santos, V. Jatenco-Pereira, & R. Opher*. 410, 732, 122-G11 (1993)
- DOXSEY, R. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- DRAKE, JEREMY. The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupuis, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine*. 410, L119, 126-D7 (1993)
- DRING, A. Voyager 2 Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murthy, A. Dring, & R. C. Henry*. 410, 714, 122-E13 (1993)
- DRING, ANDREW. Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William F. Blair, Randy A. Kimble, & Samuel T. Durrance*. 408, L97, 95-E3 (1993)

- DUBINSKI, JOHN. Void Evolution and the Large-Scale Structure. *John Dubinski, L. Nicolaci da Costa, D. S. Goldwirth, M. Lecar, & T. Piran*. 410, 458, 119-D1 (1993)
- DUFTON, P. L. LSIV $-12^{\circ}111$: A Candidate Halo Proto-Planetary Nebula. *E. S. Conlon, P. L. Dufton, R. J. H. McCausland, & F. P. Keenan*. 408, 593, 92-E11 (1993)
- DUNCAN, ROBERT C. Neutron Star Dynamos and the Origins of Pulsar Magnetism. *Christopher Thompson & Robert C. Duncan*. 408, 194, 85-E4 (1993)
- DUNCAN, W. D. Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Matthews, R. Wade, & W. D. Duncan*. 410, 650, 121-F11 (1993)
- DUPOIS, JEAN. The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupois, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine*. 410, L119, 126-D7 (1993)
- DURIC, NEB. New 325 MHz Observations of H II Galaxies: The Mechanisms That Shape the Unusual Radio Spectra. *Hans-Jörg Deeg, Elias Brinks, Neb Duric, Uli Klein, & Evan Skillman*. 410, 626, 121-D13 (1993)
- DURRANCE, SAMUEL T. Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Joyant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance*. 408, L97, 95-E3 (1993)
- Coronographic Imaging of the Bipolar Nebula around the Luminous Blue Variable R127. *Mark Clampin, Antonella Nota, David A. Golimowski, Claus Leitherer, & Samuel T. Durrance*. 410, L35, 118-C5 (1993)
- DUVALL, T. L., JR. Asymmetries of Solar Oscillation Line Profiles. *T. L. Duvall, Jr., S. M. Jefferies, J. W. Harvey, Y. Osaki, & M. A. Pomerantz*. 410, 829, 124-A13 (1993)
- DWARAKANATH, K. S. VLA Observations of IE 1740.7-2942: A Search for Radio Recombination Lines of Positronium. *K. R. Anantharamaiah, K. S. Dwarkanath, D. Morris, W. M. Goss, & V. Radhakrishnan*. 410, 110, 113-E1 (1993)
- DYER, CHARLES C. Softening in N-Body Simulations of Collisionless Systems. *Charles C. Dyer & Peter S. Ip*. 409, 60, 97-F7 (1993)
- EALLES, STEPHEN A. An Optically Luminous Radio Galaxy at $z = 3.22$ and the K-z Diagram at High Redshift. *Stephen A. Eales, Steve Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy*. 409, 578, 106-B7 (1993)
- EDWARDS, S. See SKRUTSKIE, M. F., et al. Detection of Circumstellar Gas Associated with GG Tauri.
- EFIMOV, YU. S. Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Pirola*. 410, 342, 116-C10 (1993)
- EILEK, JEAN A. Flow Dynamics and Bending of Wide-Angle Tailed Radio Sources. *Aileen A. O'Donoghue, Jean A. Eilek, & Frazer N. Owen*. 408, 428, 90-E1 (1993)
- ELIAS, NICHOLAS M., II. Elliptical Polarimetry of the Interacting Binary Star V367 Cygni. *Nicholas M. Elias II*. 410, 785, 123-E1 (1993)
- ELITZUR, MOSHE. The Dynamics of Stellar Outflows Dominated by Interaction of Dust and Radiation. *Nathan Netzer & Moshe Elitzur*. 410, 701, 122-D11 (1993)
- ELLINGER, Y. Theoretical Infrared Spectra of Some Model Polycyclic Aromatic Hydrocarbons: Effect of Ionization. *D. J. De Frees, M. D. Miller, D. Talbi, F. Pauzat, & Y. Ellinger*. 408, 530, 91-G5 (1993)
- ELLISON, DONALD C. The Injection and Acceleration of Particles in Oblique Shocks: A Unified Monte Carlo Description. *Matthew G. Baring, Donald C. Ellison, & Frank C. Jones*. 409, 327, 101-B8 (1993)
- ELVIS, M. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell*. 410, 29, 112-D11 (1993)
- ENDO, YASUKI. Laboratory Detection of a New Free Radical C₄S (Σ^-). *Yasuhiro Hirahara, Yasuhiro Ohshima, & Yasuki Endo*. 408, L113, 95-F13 (1993)
- Laboratory Detection of C₅S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Obi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami*. 410, L45, 118-D11 (1993)
- EPSTEIN, RICHARD I. Prevalent Properties of Gamma-Ray Burst Variability. *Bennett Link, Richard I. Epstein, & William C. Priedhorsky*. 408, L81, 95-B13 (1993)
- Relativistic Electron-Positron Beams in Gamma-Ray Bursters. *I. A. Smith & Richard I. Epstein*. 410, 315, 116-A6 (1993)
- ERACLEOUS, MICHAEL. A Search for Rapid Variability in the Broad H α Profiles of Seyfert and Radio Galaxies. *Michael Eracleous & Jules P. Halpern*. 409, 584, 106-C1 (1993)
- ESMOND, J. R. High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmund, K. Ito, & M. H. Stevens*. 410, 837, 124-B8 (1993)
- FABIAN, A. C. Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian*. 410, 21, 112-D1 (1993)
- Self-absorbed Active Galactic Nuclei and the Cosmic X-Ray Background. *Piero Madau, Gabriele Ghisellini, & A. C. Fabian*. 410, L7, 117-F8 (1993)
- FALCO, E. Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian*. 410, 21, 112-D1 (1993)
- FANG, L. Z. Quasar Clustering on Large Scales. *H. J. Mo & L. Z. Fang*. 410, 493, 119-G1 (1993)
- FANG, LI-ZHI. Anisotropy of Cosmic Background Radiation from a Spherical Clustering on Large Scales. *Li-Zhi Fang & Xiang-Ping Wu*. 408, 25, 83-D3 (1993)
- FATUZZO, MARCO. Understanding Soft Gamma-Ray Repeaters in the Context of the Extragalactic Radio Pulsar Origin of Gamma-Ray Bursts. *Fulvio Melia & Marco Fatuzzo*. 408, L9, 88-F1 (1993)
- FAULKNER, JOHN. Unstable Degenerates Revisited. *John Faulkner*. 408, 600, 92-F5 (1993)
- FEDERICI, L. See BENDINELLI, O., et al. The First Detection of a Collapsed Core Globular Cluster in M31.
- FEIGELSON, ERIC D. A Giant X-Ray Flare on λ Eridani (B2e). *Myron A. Smith, Carol A. Grady, Geraldine J. Peters, & Eric D. Feigelson*. 409, L49, 111-D1 (1993)
- FELDMAN, PAUL D. Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman*. 408, L41, 89-C1 (1993)
- FELDMAN, U. The He II 1640 Å Multiplet Observed from Solar Prominences: Erratum. *J. M. Laming & U. Feldman*. 409, 869, 110-A9 (1993) (Orig. paper in 403, 434, 19-B11 (1993))
- FERETTI, L. VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle*. 408, 81, 84-B4 (1993)
- VLBI Observations of a Complete Sample of Radio Galaxies. III. The Two-sided Milliarcsecond Structure of 3C 338. *L. Feretti, G. Comoretto, G. Giovannini, T. Venturi, & A. E. Wehrle*. 408, 446, 90-F7 (1993)
- FERGUSON, HENRY C. The Hot Stellar Component in Elliptical Galaxies and Spiral Bulges. I. The Far-Ultraviolet Spectrum of the Bulge of M31. *Henry C. Ferguson & Arthur F. Davidsen*. 408, 92, 84-C4 (1993)
- FERLAND, G. J. The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne*. 410, 534, 120-C11 (1993)
- FERRARO, F. R. See BENDINELLI, O., et al. The First Detection of a Collapsed Core Globular Cluster in M31.
- FERRIERE, KATIA. Magnetic Diffusion Due to Supernova Explosions and Superbubbles in the Galactic Disk. *Katia Ferrière*. 409, 248, 100-C1 (1993)

- FERRINI, FEDERICO. Evolution of Elliptical Galaxies. I. The Multiphase Model. *Federico Ferrini & Bianca Maria Poggianti*. 410, 44, 112-F4 (1993)
- FICHTEL, C. E. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the *Compton Gamma Ray Observatory*.
See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the *Compton Gamma-Ray Observatory*.
See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537–441.
See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- FIEDLER, RALPH L. Discontinuities in the Dynamic Spectrum of the Pulsar 0823+26. *Andrew W. Clegg, Ralph L. Fiedler, & James M. Cordes*. 409, 691, 107-E13 (1993)
- FIERRO, J. M. See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the *Compton Gamma-Ray Observatory*.
- FILIPPENKO, A. V. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- FILIPPENKO, ALEXEI V. The Ionizing Radiation of Seyfert 2 Galactic Nuclei. *Luis C. Ho, Joseph C. Shields, & Alexei V. Filippenko*. 410, 567, 120-F9 (1993)
- HST Observations of NGC 4395, the Least Luminous Seyfert 1 Nucleus: Evidence against the Starburst Hypothesis for Broad-lined Active Galactic Nuclei. *Alexei V. Filippenko, Luis C. Ho, & Wallace L. W. Sargent*. 410, L75, 125-F11 (1993)
- FINK, UWE. P/Halley: Effects of Time-dependent Production Rates on Spatial Emission Profiles. *Michael R. Combi & Uwe Fink*. 409, 790, 109-A1 (1993)
- FINLEY, JOHN P. ROSAT Observations of the Large Magellanic Cloud Pulsar PSR 0540–69. *John P. Finley, Hakki Ögelman, Günther Hasinger, & Joachim Trümper*. 410, 323, 116-B1 (1993)
- FISCHER, M. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5° Scale near the Star μ Pegasi.
- FITZPATRICK, E. L. Interstellar Extinction in the Infrared: The Molecular Cloud toward HD 62542. *D. C. B. Whittet, P. G. Martin, E. L. Fitzpatrick, & D. Massa*. 408, 573, 92-C11 (1993)
- FITZPATRICK, EDWARD L. Composition of Interstellar Clouds in the Disk and Halo. I. HD 93521. *Lyman Spitzer, Jr., & Edward L. Fitzpatrick*. 409, 299, 100-G3 (1993)
- FLEMING, THOMAS A. Stellar Coronae at the End of the Main Sequence: A ROSAT Survey of the Late M Dwarfs. *Thomas A. Fleming, Mark S. Giampapa, J. H. M. M. Schmitt, & Jay A. Bookbinder*. 410, 387, 116-G8 (1993)
- FONTAINE, GILLES. The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupois, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine*. 410, L119, 126-D7 (1993)
- FORMAN, W. Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian*. 410, 21, 112-D1 (1993)
- High-Resolution X-Ray Observations of the Central Region of M31 with the ROSAT Satellite. *F. A. Primini, W. Forman, & C. Jones*. 410, 615, 121-C12 (1993)
- FORREST, DAVID J. Evidence for a Spatially Extended Component of Gamma Rays from Solar Flares. *W. Thomas Vestrand & David J. Forrest*. 409, L69, 111-F8 (1993)
- FOSTER, R. S. A New Binary Millisecond Pulsar. *R. S. Foster, A. Wolszczan, & F. Camilo*. 410, L91, 126-A7 (1993)
- FOX, G. K. Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Pirola*. 410, 342, 116-C10 (1993)
- FRAIL, DALE A. Deep VLA Imaging of Pulsar-powered Nebulae and the Beaming Fraction of Young Pulsars. *Dale A. Frail & David A. Moffett*. 408, 637, 93-B5 (1993)
- FRANCOSINI, E. Flaring and Quiescent Radio Emission of UX Arietis: A Time-dependent Model. *F. Chiuderi Drago & E. Francosini*. 410, 301, 115-G3 (1993)
- FRANSSON, CLAES. The Freeze-out Phase of SN 1987A: Implications for the Light Curve. *Claes Fransson & Cecilia Kozma*. 408, L25, 89-A1 (1993)
- FRIEDLANDER, M. W. η Carinae: A New Model. *J. M. Borgwaldt & M. W. Friedlander*. 408, 230, 86-A3 (1993)
- FRUEH, MARIAN L. See MICHALITSANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- FRUM, C. I. Rotational Spectra of the $X^2\Sigma^+$ States of CaH and CaD. *C. I. Frum, J. J. Oh, E. A. Cohen, & H. M. Pickett*. 408, L61, 89-F1 (1993)
- FUKUI, Y. See SKRUTSKIE, M. F., et al. Detection of Circumstellar Gas Associated with GG Tauri.
- FULBRIGHT, MICHAEL S. JHK Photometry of WD 0950+139. *Michael S. Fulbright & James Liebert*. 410, 275, 115-E1 (1993)
- FUNG, P. C. W. A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung*. 410, 309, 115-G12 (1993)
- FUSI PECCI, F. See BENDINELLI, O., et al. The First Detection of a Collapsed Core Globular Cluster in M31.
- GABUZDA, D. C. Is 1308+326 a BL Lacertae Object or a Quasar? *D. C. Gabuzda, R. I. Kollgaard, D. H. Roberts, & J. F. C. Wardle*. 410, 39, 112-E12 (1993)
- GALLINO, R. Carbon Stars and Isotopic Ba Anomalies in Meteoritic SiC Grains. *R. Gallino, C. M. Raiteri, & M. Busso*. 410, 400, 117-A10 (1993)
- GANGA, KEN. Cross-Correlation between the 170 GHz Survey Map and the COBE Differential Microwave Radiometer First-Year Maps. *Ken Ganga, Ed Cheng, Stephan Meyer, & Lyman Page*. 410, L57, 125-E1 (1993)
- GASKELL, C. M. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- GAZZAZI, GIUSEPPE. 21 Centimeter Study of Spiral Galaxies in Clusters. III. Neutral Gas Content, Star Formation, and Radio Continuum Properties. *Marco Scodreggio & Giuseppe Gavazzi*. 409, 110, 98-C8 (1993)
- GEBALLE, T. R. Detection of H_3^+ Infrared Emission Lines in Saturn. *T. R. Geballe, M.-F. Jagod, & T. Oka*. 408, L109, 95-F7 (1993)
- GEHRELS, NEIL. The Secondary Maxima in Black Hole X-Ray Nova Light Curves: Clues toward a Complete Picture. *Wan Chen, Mario Livio, & Neil Gehrels*. 408, L5, 88-E8 (1993)
- GEHRZ, R. D. The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- GEZARI, D. Y. High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman*. 409, L5, 104-B1 (1993)
- GHEZ, A. M. Multiplicity and the Ages of the Stars in the Taurus Star-forming Region. *M. Simon, A. M. Ghez, & Ch. Leinert*. 408, L33, 89-B1 (1993)
- GHISELLINI, GABRIELE. Self-absorbed Active Galactic Nuclei and the Cosmic X-Ray Background. *Piero Madau, Gabriele Ghisellini, & A. C. Fabian*. 410, L7, 117-F8 (1993)
- GIAMPAPA, MARK S. Stellar Coronae at the End of the Main Sequence: A ROSAT Survey of the Late M Dwarfs. *Thomas A. Fleming, Mark S. Giampapa, J. H. M. M. Schmitt, & Jay A. Bookbinder*. 410, 387, 116-G8 (1993)
- GIOVANNINI, G. VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle*. 408, 81, 84-B4 (1993)
- VLBI Observations of a Complete Sample of Radio Galaxies. III. The Two-sided Milliarsecond Structure of 3C 338. *L. Feretti, G. Comoretto, G. Giovannini, T. Venturi, & A. E. Wehrle*. 408, 446, 90-F7 (1993)

- GLASSGOLD, ALFRED E. The Formation of Cyanopolyne Molecules in IRC +10216. *Isabelle Cherchneff, Alfred E. Glassgold, & Gary A. Mamon*. 410, 188, 114-D12 (1993)
- Detection of O I and Si II Far-Infrared Fine-Structure Emission from α Orionis. *Michael R. Haas & Alfred E. Glassgold*. 410, L111, 126-C9 (1993)
- GOLDMAN, I. Cosmic Turbulence Revisited. *I. Goldman & V. M. Canuto*. 409, 495, 105-B1 (1993)
- GOLDSTEIN, BRUCE E. Numerical Solution of Wave Equations for the Stability of the Inner Cometo-Sheath. *Krishna M. Srivastava, Bruce T. Tsurutani, & Bruce E. Goldstein*. 409, 782, 108-G7 (1993)
- GOLDWIRTH, D. S. Void Evolution and the Large-Scale Structure. *John Dubinski, L. Nicolaci da Costa, D. S. Goldwirth, M. Lecar, & T. Piran*. 410, 458, 119-D1 (1993)
- GOLIMOWSKI, DAVID A. Coronagraphic Imaging of the Bipolar Nebula around the Luminous Blue Variable R127. *Mark Clampin, Antonella Nota, David A. Golimowski, Claus Leitherer, & Samuel T. Durrance*. 410, L35, 118-C5 (1993)
- GOMER, RICHARD. On the Location of the Oscillations in AE Aquarii. *William F. Welsh, Keith Horne, & Richard Gomer*. 410, L39, 118-D1 (1993)
- GÓMEZ, J. F. Further Studies on the Champagne Phase of GM 24 (IRAS 17136-3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho*. 409, 269, 100-D10 (1993)
- GÓMEZ, JOSÉ F. A Flattened Cloud Core in NGC 2024. *Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó*. 408, 565, 92-C1 (1993)
- GÓMEZ, Y. Further Studies on the Champagne Phase of GM 24 (IRAS 17136-3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho*. 409, 269, 100-D10 (1993)
- GOMEZ DE CASTRO, ANA I. The Origin of Forbidden Line Emission from Young Stellar Objects. *Ana I. Gomez de Castro & Ralph E. Pudritz*. 409, 748, 108-D3 (1993)
- GONZÁLEZ-CASADO, GUILLERMO. Small-Scale Substructure in Relaxed Clusters. I. Statistical Characterization. *Eduard Salvador-Solé, Guillermo González-Casado, & José María Solanes*. 410, 1, 112-B1 (1993)
- Small-Scale Substructure in Relaxed Clusters. II. Clustering Model. *Guillermo González-Casado, José María Solanes, & Eduard Salvador-Solé*. 410, 15, 112-C8 (1993)
- GOODE, PHILIP R. Observation of Impulsive Acoustic Events and the Excitation of Solar Oscillations. *Sergio R. Restaino, Robin T. Stebbins, & Philip R. Goode*. 408, L57, 89-E9 (1993)
- GÓRSKI, KRZYSZTOF M. Cold Dark Matter and Degree-Scale Cosmic Microwave Background Anisotropy Statistics after COBE. *Krzysztof M. Górski, Radosław Stompor, & Roman Juszkiewicz*. 410, L1, 117-F1 (1993)
- Experiment-specific Cosmic Microwave Background Calculations Made Easier: Approximation Formula for Smoothed $\delta T/T$ Windows. *Krzysztof M. Górski*. 410, L65, 125-E13 (1993)
- GOSS, W. M. VLA Observations of 1E 1740.7-2942: A Search for Radio Recombination Lines of Positronium. *K. R. Anantharamaiah, K. S. Dwarakanath, D. Morris, W. M. Goss, & V. Radhakrishnan*. 410, 110, 113-E1 (1993)
- GOTO, MASAHIRO. Laboratory Submillimeter-Wave Observation of the $N = 1-0$ Transition of the $\text{ND}^3\Sigma^-$ Radical. *Shuji Saito & Masahiro Goto*. 410, L53, 118-C7 (1993)
- GOULD, A. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- GRADY, C. A. The Galactic Halo and Local Interstellar Medium toward PKS 2155-304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo*. 409, 199, 99-D6 (1993)
- GRADY, CAROL A. A Giant X-Ray Flare on λ Eridani (B2e). *Myron A. Smith, Carol A. Grady, Geraldine J. Peters, & Eric D. Feigelson*. 409, L49, 111-D1 (1993)
- GRAHAM, J. A. Ice Grains in the Corona Australis Molecular Cloud. *W. P. Chen & J. A. Graham*. 409, 319, 101-A11 (1993)
- GRAHAM, J. R. Molecular Gas in Powerful Radio Galaxies Detected by IRAS. *J. M. Mazzarella, J. R. Graham, D. B. Sanders, & S. Djorgovski*. 409, 170, 99-A13 (1993)
- GRAHAM, JAMES R. H_2 Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith*. 408, L105, 95-F1 (1993)
- GRAMANN, MIRT. Redshift Space Clustering of Galaxies and Cold Dark Matter Model. *Neta A. Bahcall, Renyue Cen, & Mirt Gramann*. 408, L77, 95-B7 (1993)
- GRASDALEN, G. L. Spatially Resolved Spectra of the Unidentified Infrared Features around HD 44179 (The Red Rectangle). *G. C. Sloan, G. L. Grasdalen, & Paul D. LeVan*. 409, 412, 102-B3 (1993)
- GREENE, THOMAS P. Infrared Images of the Young Cluster NGC 2264. *Charles J. Lada, Erick T. Young, & Thomas P. Greene*. 408, 471, 91-A11 (1993)
- GRINDLAY, J. E. A Supersoft Variable Low-Luminosity X-Ray Source in the Globular Cluster M3. *P. Hertz, J. E. Grindlay, & C. D. Bailyn*. 410, L87, 126-A1 (1993)
- GRINDLAY, JONATHAN E. Discovery of Multiple Low-Luminosity X-Ray Sources in NGC 6397. *Adrienne M. Cool, Jonathan E. Grindlay, Martin Krockenberger, & Charles D. Bailyn*. 410, L103, 126-B11 (1993)
- GROSSMAN, E. N. Extended CO(7-6) Emission from Warm Gas in Orion. *J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey*. 410, 179, 114-D1 (1993)
- GRUNSFELD, JOHN M. An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7-2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone*. 408, 507, 91-E7 (1993)
- GUNDERSEN, J. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5° Scale near the Star μ Pegasi.
- GWINN, C. R. Angular Broadening of Pulsars and the Distribution of Interstellar Plasma Fluctuations. *C. R. Gwinn, N. Bartel, & J. M. Cordes*. 410, 673, 122-A13 (1993)
- HAAS, MICHAEL R. Detection of O I and Si II Far-Infrared Fine-Structure Emission from α Orionis. *Michael R. Haas & Alfred E. Glassgold*. 410, L111, 126-C9 (1993)
- HAKALA, P. The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. *V. Pirola, P. Hakala, & G. V. Coyne, S. J.* 410, L107, 126-C3 (1993)
- HALPERN, JULES P. A Search for Rapid Variability in the Broad $\text{H}\alpha$ Profiles of Seyfert and Radio Galaxies. *Michael Eracleous & Jules P. Halpern*. 409, 584, 106-C1 (1993)
- HAN, M. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer*. 409, 14, 97-C1 (1993)
- HAN, MINGSHENG. The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverly J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne*. 410, 534, 120-C11 (1993)
- HANES, DAVID A. Globular Clusters and cD Formation: The Case of M87. *Dean E. McLaughlin, William E. Harris, & David A. Hanes*. 409, L45, 111-C8 (1993)
- HARRIS, WILLIAM E. Globular Clusters and cD Formation: The Case of M87. *Dean E. McLaughlin, William E. Harris, & David A. Hanes*. 409, L45, 111-C8 (1993)
- HARTIGAN, PATRICK. The Formation and Evolution of Shocks in Stellar Jets from a Variable Wind. *Patrick Hartigan & John Raymond*. 409, 705, 107-G5 (1993)
- The Bow Shock and Mach Disk of HH 111V. *Jon A. Morse, Steve Heathcote, Gerald Cecil, Patrick Hartigan, & John C. Raymond*. 410, 764, 123-C5 (1993)
- HARTMAN, R. C. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.

- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- HARTMANN, DIETER H. Diffuse Gamma-Ray Emission from Pulsars in the Large Magellanic Cloud. *Dieter H. Hartmann, Lawrence E. Brown, & Neil Schnepf.* 408, L13, 88-F8 (1993)
- HARVEY, J. W. Asymmetries of Solar Oscillation Line Profiles. *T. L. Duval, Jr., S. M. Jefferies, J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 410, 829, 124-A13 (1993)
- HASAN, HASHIMA. Galactic Bars with Central Mass Concentrations: Three-dimensional Dynamics. *Hashima Hasan, Daniel Pfenniger, & Colin Norman.* 409, 91, 98-B1 (1993)
- HASCHICK, AUBREY D. 4_{-1-3_0} E Methanol Emission in G1.6-0.025. *Aubrey D. Haschick & Willem A. Baan.* 410, 663, 121-G12 (1993)
- HASEGAWA, T. I. Chemical Differentiation between Star-forming Regions: The Orion Hot Core and Compact Ridge. *P. Caselli, T. I. Hasegawa, & Eric Herbst.* 408, 548, 92-A11 (1993)
- HASINGER, GÜNTHER. ROSAT Observations of the Large Magellanic Cloud Pulsar PSR 0540-69. *John P. Finley, Hakki Ögelman, Günther Hasinger, & Joachim Trümper.* 410, 323, 116-B1 (1993)
- HATZES, ARTIE P. Doppler Imaging Stars with Moderate Rotation: The Spot Distribution on σ Geminorum. *Artie P. Hatzes.* 410, 777, 123-D7 (1993)
- HAWKINS, ISABEL. The Interstellar $^7\text{Li}/^6\text{Li}$ Isotope Ratio toward ζ Ophiuchi and ζ Persei. *David M. Meyer, Isabel Hawkins, & Edward L. Wright.* 409, L61, 111-E8 (1993)
- HAYASHI, M. See SKRUTSKIE, M. F., et al. Detection of Circumstellar Gas Associated with GG Tauri.
- HEATHCOTE, STEVE. A New Herbig-Haro Flow in the HH 1-2 Complex. *Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga.* 408, L49, 89-D1 (1993)
- The Bow Shock and Mach Disk of HH 111V. *Jon A. Morse, Steve Heathcote, Gerald Cecil, Patrick Harigan, & John C. Raymond.* 410, 764, 123-C5 (1993)
- HEINDL, WILLIAM A. An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7-2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 408, 507, 91-E7 (1993)
- HELLER, CLAYTON H. Encounters with Protostellar Disks. I. Disk Tilt and the Nonzero Solar Obliquity. *Clayton H. Heller.* 408, 337, 87-C11 (1993)
- HENRY, R. C. *Voyager 2* Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murthy, A. Dring, & R. C. Henry.* 410, 714, 122-E13 (1993)
- HENRY, RICHARD C. Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance.* 408, L97, 95-E3 (1993)
- HERBST, ERIC. Chemical Differentiation between Star-forming Regions: The Orion Hot Core and Compact Ridge. *P. Caselli, T. I. Hasegawa, & Eric Herbst.* 408, 548, 92-A11 (1993)
- HERBST, T. M. H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith.* 408, L105, 95-F1 (1993)
- HERNQUIST, LARS. Structure of Merger Remnants. II. Progenitors with Rotating Bulges. *Lars Hernquist.* 409, 548, 105-F12 (1993)
- HERTZ, P. A. Supersoft Variable Low-Luminosity X-Ray Source in the Globular Cluster M3. *P. Hertz, J. E. Grindlay, & C. D. Bailyn.* 410, L87, 126-A1 (1993)
- HESSER, JAMES E. Canada-France-Hawaii Telescope Observations of Globular Cluster Cores: Blue Straggler Stars in M3 (NGC 5272, GC 1339+286). *Michael Bolte, James E. Hesser, & Peter B. Stetson.* 408, L89, 95-C11 (1993)
- HEWITT, J. N. Further Radio Investigations of Gravitational Lensing in MG 0414+0534. *C. A. Katz & J. N. Hewitt.* 409, L9, 104-B11 (1993)
- HILL, GARY J. An Optically Luminous Radio Galaxy at $z = 3.22$ and the $K-z$ Diagram at High Redshift. *Stephen A. Eales, Steve Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy.* 409, 578, 106-B7 (1993)
- HILL, K. W. High-Resolution Measurements, Line Identification, and Spectral Modeling of K α Transitions in Fe XVIII-Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn.* 409, 846, 109-F6 (1993)
- HIRAHARA, YASUHIRO. Laboratory Detection of a New Free Radical C₄S ($^3\Sigma^-$). *Yasuhiro Hirahara, Yasuhiro Ohshima, & Yasuki Endo.* 408, L113, 95-F13 (1993)
- Laboratory Detection of C₃S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Ohi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami.* 410, L45, 118-D11 (1993)
- HIRANO, TSUNEO. An Ab Initio Prediction of the Spectroscopic Constants of MgNC: The First Mg-bearing Molecule in Space. *Keisaku Ishii, Tsunee Hirano, Umpei Nagashima, Bernhard Weis, & Koichi Yamashita.* 410, L43, 118-D7 (1993)
- HO, LUIS C. The Ionizing Radiation of Seyfert 2 Galactic Nuclei. *Luis C. Ho, Joseph C. Shields, & Alexei V. Filippenko.* 410, 567, 120-F9 (1993)
- HST Observations of NGC 4395, the Least Luminous Seyfert 1 Nucleus: Evidence against the Starburst Hypothesis for Broad-lined Active Galactic Nuclei. *Alexei V. Filippenko, Luis C. Ho, & Wallace L. W. Sargent.* 410, L75, 125-F11 (1993)
- HO, P. T. P. Further Studies on the Champagne Phase of GM 24 (IRAS 17136-3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho.* 409, 269, 100-D10 (1993)
- HO, PAUL T. P. A Flattened Cloud Core in NGC 2024. *Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó.* 408, 565, 92-C1 (1993)
- From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. *José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó.* 410, 202, 114-F1 (1993)
- HODGE, TRACY. The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- HODGES, MARK W. VLBI Astrometric Identification of the Radio-emitting Region in Algol and Determination of the Orientation of the Close Binary. *Jean-François Lestrade, Robert B. Phillips, Mark W. Hodges, & Robert A. Preston.* 410, 808, 123-G1 (1993)
- HOLBERG, J. B. *Voyager 2* Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murthy, A. Dring, & R. C. Henry.* 410, 714, 122-E13 (1993)
- HOLMES, W. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.°5 Scale near the Star μ Pegasi.
- HOOD, A. W. Oscillations of a Quiescent Solar Prominence Embedded in a Hot Corona. *R. Oliver, J. L. Ballester, A. W. Hood, & E. R. Priest.* 409, 809, 109-B12 (1993)
- HORNE, KEITH. On the Mass of Nova DQ Herculis (1934). *Keith Horne, William F. Welsh, & Richard A. Wade.* 410, 357, 116-E1 (1993)
- On the Location of the Oscillations in AE Aquarii. *William F. Welsh, Keith Horne, & Richard Gomer.* 410, L39, 118-D1 (1993)
- HOWE, J. E. Extended CO(7-6) Emission from Warm Gas in Orion. *J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey.* 410, 179, 114-D1 (1993)
- HOYLE, F. A Quasi-Steady State Cosmological Model with Creation of Matter. *F. Hoyle, G. Burbidge, & J. V. Narlikar.* 410, 437, 119-B7 (1993)
- HRISTOV, V. V. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- HRIVNAK, BRUCE J. Photometry and Imaging of the Peculiar Planetary Nebula IRAS 21282+5050. *Sun Kwok, Bruce J. Hrivnak, & Philip P. Langill.* 408, 586, 92-E3 (1993)
- HU, XIHAI. Discovery of New Objects in the Orion Nebula on HST Images: Shocks, Compact Sources, and Protoplanetary Disks. *C. R. O'Dell, Zheng Wen, & Xihai Hu.* 410, 696, 122-C11 (1993)

- HUCHRA, J. P. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer.* 409, 14, 97-C1 (1993)
- HUMMEL, CHRISTIAN A. A Massive Binary Black Hole in 1928+738? *Nico Roos, Jelle S. Kaastra, & Christian A. Hummel.* 409, 130, 98-E8 (1993)
- HUNTER, S. D. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory. *S. D. Hunter, D. L. Bertsch, B. L. Dingus, C. E. Fichtel, R. C. Hartman, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, P. Möller, C. von Montigny, P. L. Nolan, K. Pinkau, H.-D. Radecke, H. Rothermel, P. Shaver, E. Schneid, M. Sommer, P. Sreekumar, & D. J. Thompson.* 409, 134, 98-E13 (1993)
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- HUTCHINGS, J. B. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- Hubble Space Telescope Spectra of the Phase-modulated Wind in the SMC O+WR Binary R31.* *J. B. Hutchings, L. Bianchi, & S. C. Morris.* 410, 803, 123-F10 (1993)
- HYUNG, S. Fe III Emission Lines in the Optical Spectrum of the Planetary Nebula IC 4997. *F. P. Keenan, L. H. Aller, S. Hyung, E. S. Conlon, & G. A. Warren.* 410, 430, 117-D3 (1993)
- IBEN, ICKO, JR. The Hyades Cluster-Supercluster Connection: Evidence for a Local Concentration of Dark Matter. *Stefano Casertano, Icko Iben, Jr., & Aaron Shlics.* 410, 90, 113-C5 (1993)
- IJIMA, T. The Nature of the Doppler Shift Residuals and Some Peculiar Phenomena of SS 433. *T. Iijima.* 410, 295, 115-F10 (1993)
- IKEUCHI, SATORU. On the Origin of H I Absorption Systems of Quasars. *Izumi Murakami & Satoru Ikeuchi.* 409, 42, 97-E1 (1993)
- IP, PETER S. S. Softening in N-Body Simulations of Collisionless Systems. *Charles C. Dyer & Peter S. S. Ip.* 409, 60, 97-F7 (1993)
- ISHII, KEISAKU. An Ab Initio Prediction of the Spectroscopic Constants of MgNC: The First Mg-bearing Molecule in Space. *Keisaku Ishii, Tsuneo Hirano, Umpei Nagashima, Bernhard Weis, & Koichi Yamashita.* 410, 143, 118-D7 (1993)
- ITO, K. High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmond, K. Ito, & M. H. Stevens.* 410, 837, 124-B8 (1993)
- ITO, MAKOTO. Clusters and Groups of Galaxies as Cosmological Probes. *Haruhiko Ueda, Makoto Itoh, & Yasushi Suto.* 408, 3, 83-B5 (1993)
- IWASAWA, K. X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai.* 409, 155, 98-G9 (1993)
- JACOBS, V. L. High-Resolution Measurements, Line Identification, and Spectral Modeling of K α Transitions in Fe XVIII-Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn.* 409, 846, 109-F6 (1993)
- JAFFE, D. T. Extended CO(7 \rightarrow 6) Emission from Warm Gas in Orion. *J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey.* 410, 179, 114-D1 (1993)
- JAGOD, M.-F. Detection of H $_2^+$ Infrared Emission Lines in Saturn. *T. R. Geballe, M.-F. Jagod, & T. Oka.* 408, L109, 95-F7 (1993)
- JAHOBA, K. M. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- JATENCO-PEREIRA, V. Mass Loss from Wolf-Rayet Stars Due to Radiation Pressure and Alfvén Waves. *L. C. dos Santos, V. Jatenco-Pereira, & R. Opher.* 410, 732, 122-G11 (1993)
- JEFFERIES, S. M. Asymmetries of Solar Oscillation Line Profiles. *T. L. Duvall, Jr., S. M. Jefferies, J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 410, 829, 124-A13 (1993)
- JENNINGS, D. E. High-Resolution Mid-Infrared Spectra of Co II, Ni I, and Fe II in SN 1987A. *D. E. Jennings, R. J. Boyle, G. R. Wiedemann, & S. H. Moseley.* 408, 277, 86-E5 (1993)
- JOHNSTON, S. A Young, Glitching Pulsar near the Direction of W28. *V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar.* 409, L57, 111-E1 (1993)
- JONES, BURTON F. The Evolution of Angular Momentum among Zero-Age Main-Sequence Solar-Type Stars. *David R. Soderblom, John R. Stauffer, Keith B. MacGregor, & Burton F. Jones.* 409, 624, 106-F13 (1993)
- JONES, C. Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian.* 410, 21, 112-D1 (1993)
- High-Resolution X-Ray Observations of the Central Region of M31 with the ROSAT Satellite. *F. A. Primini, W. Forman, & C. Jones.* 410, 615, 121-C12 (1993)
- JONES, FRANK C. The Injection and Acceleration of Particles in Oblique Shocks: A Unified Monte Carlo Description. *Mathew G. Baring, Donald C. Ellison, & Frank C. Jones.* 409, 327, 101-B8 (1993)
- JONES, TERRY J. The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- JUDGE, P. G. Chromospheric Heating by Acoustic Shocks: A Confrontation of GHRs Observations of α Tauri (K5 III) with Ab Initio Calculations. *P. G. Judge & M. Cuntz.* 409, 776, 108-F13 (1993)
- JUNG, YOUNG-DAE. Semiclassical Approximation for Electron Impact Excitation of Hydrogenic Ions. *Young-Dae Jung.* 409, 841, 109-E12 (1993)
- JUSZKIEWICZ, ROMAN. Cold Dark Matter and Degree-Scale Cosmic Microwave Background Anisotropy Statistics after COBE. *Krzysztof M. Górski, Radosław Stompór, & Roman Juszkiewicz.* 410, L1, 117-F1 (1993)
- KAASTRA, JELLE S. A Massive Binary Black Hole in 1928+738? *Nico Roos, Jelle S. Kaastra, & Christian A. Hummel.* 409, 130, 98-E8 (1993)
- KÄPPELER, F. The s-Process between A = 120 and 124: Signature of Neutron Density and Temperature in Red Giants. *F. Käppeler, W. Schanz, K. Wisshak, & G. Reffo.* 410, 370, 116-F3 (1993)
- KÄUFL, HANS ULRICH. Search for Ionized Cores in Proto-Planetary Nebulae, and the Asymptotic Giant Branch to Planetary Nebula Transition. *Hans Ulrich Käufel, Alvio Renzini, & Letizia Stanghellini.* 410, 251, 115-C1 (1993)
- KAHN, S. M. High-Resolution Measurements, Line Identification, and Spectral Modeling of K α Transitions in Fe XVIII-Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn.* 409, 846, 109-F6 (1993)
- KANBACH, G. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- KAROVSKA, M. See MICHALITSANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- KASAI, YASUKO. Laboratory Detection of C $_2$ S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Obi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo,*

- Kentarou Kawaguchi, & Akinori Murakami. 410, L45, 118-D11 (1993)
- KASPI, V. M. A Young, Glitching Pulsar near the Direction of W28. *V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar*. 409, L57, 111-E1 (1993)
- KASTNER, S. O. The Optically Thin C III Spectrum: Line and Multiplet Intensities. *A. K. Bhatia & S. O. Kastner*. 408, 744, 94-D7 (1993)
- KATZ, C. A. Further Radio Investigations of Gravitational Lensing in MG 0414+0534. *C. A. Katz & J. N. Hewitt*. 409, L9, 104-B11 (1993)
- KAWADA, M. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- KAWAGUCHI, KENTAROU. Laboratory Detection of C₅S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Ohi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami*. 410, L45, 118-D11 (1993)
- KAWARA, KIMIaki. Near-Infrared Spectroscopy of the Peculiar Giant Elliptical NGC 1275. *Kimiaki Kawara & Yoshiaki Taniguchi*. 410, L19, 117-G13 (1993)
- KEENAN, F. P. LSIV -12°111: A Candidate Halo Proto-Planetary Nebula. *E. S. Conlon, P. L. Dufton, R. I. H. McCausland, & F. P. Keenan*. 408, 593, 92-E11 (1993)
- The Ratio of Optical-to-Infrared Emission Line Strengths in Ar III as Electron Density Diagnostics for Planetary Nebulae. *F. P. Keenan & E. S. Conlon*. 410, 426, 117-C12 (1993)
- Fe III Emission Lines in the Optical Spectrum of the Planetary Nebula IC 4997. *F. P. Keenan, L. H. Aller, S. Hyung, E. S. Conlon, & G. A. Warren*. 410, 430, 117-D3 (1993)
- KELLEY, R. L. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- KELSON, DANIEL D. Modeling the Structure of H I in the Galactic Disk. *Joel N. Bregman, Daniel D. Kelson, & Gregory A. Ashe*. 409, 682, 107-D9 (1993)
- KIMBLE, RANDY A. Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman*. 408, L41, 89-C1 (1993)
- Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance*. 408, L97, 95-E3 (1993)
- KIRHAKOS, S. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- KLEIN, ULI. New 325 MHz Observations of H II Galaxies: The Mechanisms That Shape the Unusual Radio Spectra. *Hans-Jörg Deeg, Elias Brinks, Neb Duric, Uli Klein, & Evan Skillman*. 410, 626, 121-D13 (1993)
- KLEY, W. Two-dimensional Viscous Accretion Disk Models. II. On Viscous Overstability. *W. Kley, J. C. B. Papaloizou, & D. N. C. Lin*. 409, 739, 108-C6 (1993)
- KNAPP, G. R. Circumstellar Shells Resolved in IRAS Survey Data. II. Analysis. *K. Young, T. G. Phillips, & G. R. Knapp*. 409, 725, 108-B3 (1993)
- KNIFFEN, D. A. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- KO, CHUNG-MING. A Similarity Solution to the Kinematic $\alpha^2\omega$ Dynamo Equation with Time-dependent Coefficients. *Chung-Ming Ko*. 410, 128, 113-F8 (1993)
- KOBULNICKY, H. A. The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- KÖNIGL, ARIEH. The Structure of Protostellar Accretion Disks and the Origin of Bipolar Flows. *Mark Wardle & Arie H. Königl*. 410, 218, 114-G6 (1993)
- KOERNER, D. W. Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. *D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith*. 408, L93, 95-D7 (1993)
- KOGUT, A. Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky*. 409, 1, 97-B1 (1993)
- KOLLATSCHNY, W. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- KOLGAARD, R. I. Is 1308+326 a BL Lacertae Object or a Quasar? *D. C. Gabuzda, R. I. Kollgaard, D. H. Roberts, & J. F. C. Wardle*. 410, 39, 112-E12 (1993)
- KONDO, YOJI. The Galactic Halo and Local Intergalactic Medium toward PKS 2155-304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo*. 409, 199, 99-D6 (1993)
- KORATKAR, A. P. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- KORISTA, K. T. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- KOYAMA, K. X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai*. 409, 155, 98-G9 (1993)
- KOZMA, CECILIA. The Freeze-out Phase of SN 1987A: Implications for the Light Curve. *Claes Fransson & Cecilia Kozma*. 408, L25, 89-A1 (1993)
- KROCKENBERGER, MARTIN. Discovery of Multiple Low-Luminosity X-Ray Sources in NGC 6397. *Adrienne M. Cool, Jonathan E. Grindlay, Martin Krokenberger, & Charles D. Bailyn*. 410, L103, 126-B11 (1993)
- KROGULEC, M. A Highly Sensitive Radio Survey of Symbiotic Stars at 3.6 Centimeters. *E. R. Seaquist, M. Krogulec, & A. R. Taylor*. 410, 260, 115-C12 (1993)
- KROLIK, JULIAN H. Compton Scattering and the Gamma-Ray Power-Law Spectrum in Markarian 421. *Andrzej A. Zdziarski & Julian H. Krolik*. 409, L33, 111-B1 (1993)
- KRUK, JEFFREY W. Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance*. 408, L97, 95-E3 (1993)
- KUHN, JEFFREY R. Unbound Dwarf Spheroidal Galaxies and the Mass of the Milky Way. *Jeffrey R. Kuhn*. 409, L13, 104-C1 (1993)
- KUIJKEN, KONRAD. Self-consistent Models for Triaxial Galaxies with Flat Rotation Curves: The Disk Case. *Konrad Kuijken*. 409, 68, 97-G1 (1993)
- KULKARNI, S. R. The Binary Pulsar PSR 1908+00 in NGC 6760. *W. T. S. Deich, J. Middleton, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan*. 410, L95, 126-A13 (1993)
- KUMAR, PAWAN. g-Modes and the Solar Neutrino Problem. *John N. Bahcall & Pawan Kumar*. 409, L73, 111-G1 (1993)
- KUNDIĆ, TOMISLAV. The Velocity Dispersion of the Caustic Network Due to Random Motion of Individual Stars in the Lensing Galaxy. *Tomislav Kundić, Hans J. Witt, & Kyongae Chang*. 409, 537, 105-E13 (1993)
- KUNIEDA, H. X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai*. 409, 155, 98-G9 (1993)
- KWOK, P. W. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.

- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- KWOK, SUN. Photometry and Imaging of the Peculiar Planetary Nebula IRAS 21282+5050. *Sun Kwok, Bruce J. Hrivnak, & Philip P. Langill* 408, 586, 92-E3 (1993)
- LACHÎÈZE-REY, M. Beyond the Zel'dovich Approximation. *M. Lachîze-Rey* 408, 403, 90-C1 (1993)
- LACY, MARK. An Optically Luminous Radio Galaxy at $z = 3.22$ and the $K-z$ Diagram at High Redshift. *Stephen A. Eales, Steve Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy* 409, 578, 106-B7 (1993)
- LADA, CHARLES J. Infrared Images of the Young Cluster NGC 2264. *Charles J. Lada, Erick T. Young, & Thomas P. Greene* 408, 471, 91-A11 (1993)
- LADA, E. A. An Infrared Survey for Embedded Young Stars in the Perseus Molecular Cloud Complex. *E. F. Ladd, E. A. Lada, & P. C. Myers* 410, 168, 114-C1 (1993)
- LADD, E. F. An Infrared Survey for Embedded Young Stars in the Perseus Molecular Cloud Complex. *E. F. Ladd, E. A. Lada, & P. C. Myers* 410, 168, 114-C1 (1993)
- LAGUNA, PABLO. Tidal Disruptions by Supermassive Black Holes: Hydrodynamic Evolution of Stars on a Schwarzschild Background. *Pablo Laguna, Warner A. Miller, Wojciech H. Zurek, & Melvyn B. Davies* 410, L83, 125-G9 (1993)
- LAMB, D. Q. Disk Plus Halo Models of Gamma-Ray Burst Sources. *I. A. Smith & D. Q. Lamb* 410, L23, 118-A9 (1993)
- LAMBERT, DAVID L. The ${}^6\text{Li}/{}^7\text{Li}$ Ratio in the Metal-poor Halo Dwarfs HD 19445 and HD 84937. *Verne V. Smith, David L. Lambert, & Poul E. Nissen* 408, 262, 86-D1 (1993)
- LAME, N. J. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- LAMING, J. M. The He II 1640 Å Multiplet Observed from Solar Prominences: Erratum. *J. M. Laming & U. Feldman* 409, 869, 110-A9 (1993) (Orig. paper in 403, 434, 19-B11 (1993))
- LANDSMAN, WAYNE. A Catalog of Stellar Lyman-Alpha Fluxes. *Wayne Landsman & Theodore Simon* 408, 305, 87-A1 (1993)
- LANGE, A. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5 Scale near the Star μ Pegasi.
- LANGE, A. E. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- LANGER, WILLIAM D. Hierarchical Structure Analysis of Interstellar Clouds Using Nonorthogonal Wavelets. *William D. Langer, Robert W. Wilson, & Charles H. Anderson* 408, L45, 89-C7 (1993)
- ${}^{12}\text{C}/{}^{13}\text{C}$ Isotope Ratio in the Local Interstellar Medium from Observations of ${}^{13}\text{C}^{18}\text{O}$ in Molecular Clouds. *William D. Langer & Arno A. Penzias* 408, 539, 92-A1 (1993)
- LANGILL, PHILIP P. Photometry and Imaging of the Peculiar Planetary Nebula IRAS 21282+5050. *Sun Kwok, Bruce J. Hrivnak, & Philip P. Langill* 408, 586, 92-E3 (1993)
- LAOR, A. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- LAPOINTE, L. Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Pirola* 410, 342, 116-C10 (1993)
- LASENBY, ANTHONY. Highly Blueshifted H I Gas toward the Galactic Center. *Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall* 410, L27, 118-G12 (1993)
- LAITANZIO, JOHN C. Energy Generation in Convective Shells of Low-Mass, Low-Metallicity Asymptotic Giant Branch Stars. *Grant Bazan & John C. Lattanzio* 409, 762, 108-E6 (1993)
- LAU, E. L. Upper Limits for Gravitational Radiation from Supermassive Coalescing Binaries. *J. D. Anderson, J. W. Armstrong, & E. L. Lau* 408, 287, 86-F4 (1993)
- LAUER, TOD R. The Shapes of Brightest Cluster Galaxies. *Barbara S. Ryden, Tod R. Lauer, & Marc Postman* 410, 515, 120-B1 (1993)
- LAURIKAINEN, EIIJA. The Interacting System NGC 7753-7752 (Arp 86). I. BVRI Photometry. *Eija Laurikainen, Heikki Salo, & Antonio Aparicio* 410, 574, 120-G3 (1993)
- The Interacting System NGC 7753-7752 (Arp 86). II. N-Body Modeling. *Heikki Salo & Eija Laurikainen* 410, 586, 121-A6 (1993)
- LAWLER, J. E. Radiative Lifetimes, Branching Ratios, and Absolute Transition Probabilities in Cr II and Zn II. *S. D. Bergeson & J. E. Lawler* 408, 382, 88-A3 (1993)
- LAWRENCE, G. F. The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr* 408, L37, 89-B8 (1993)
- LEBLANC, F. Light-induced Drift and Abundance Anomalies. *F. LeBlanc & G. Michaud* 408, 251, 86-C1 (1993)
- LEBOVITZ, NORMAN. Local Hydrodynamic Instability of Rotating Stars. *Alexander Lifschitz & Norman Lebovitz* 408, 603, 92-F9 (1993)
- LECAR, M. Void Evolution and the Large-Scale Structure. *John Dubinski, L. Nicolaci da Costa, D. S. Goldwirth, M. Lecar, & T. Piran* 410, 458, 119-D1 (1993)
- LEE, HYUNG MOK. Postcollapse Evolution of Globular Clusters Dominated by Tidal Binary Heating. *Hyung Mok Lee & Jeremiah P. Ostriker* 409, 617, 106-F3 (1993)
- LEE, MYUNG GYOON. The Distance to Nearby Galaxy NGC 3109 Based on the Tip of the Red Giant Branch. *Myung Gyoong Lee* 408, 409, 90-C8 (1993)
- LEE, WEI. Laboratory Spectra of Polycyclic Aromatic Hydrocarbon Ions and the Interstellar Extinction Curve. *Wei Lee & Thomas J. Wdowiak* 410, L127, 126-E5 (1993)
- LEINERT, CH. Multiplicity and the Ages of the Stars in the Taurus Star-forming Region. *M. Simon, A. M. Ghez, & Ch. Leinert* 408, L33, 89-B1 (1993)
- LEITHERER, CLAUS. Coronagraphic Imaging of the Bipolar Nebula around the Luminous Blue Variable R127. *Mark Clampin, Antonella Nota, David A. Golimowski, Claus Leitherer, & Samuel T. Durrance* 410, L35, 118-C5 (1993)
- LEQUEUX, J. Detection of CO Emission from Massive Molecular Clouds in the Inner Disk of M31. *Ronald J. Allen & J. Lequeux* 410, L15, 117-G7 (1993)
- LESTRADE, JEAN-FRANÇOIS. VLBI Astrometric Identification of the Radio-emitting Region in Algol and Determination of the Orientation of the Close Binary. *Jean-François Lestrade, Robert B. Phillips, Mark W. Hodges, & Robert A. Preston* 410, 808, 123-G1 (1993)
- LEUNG, P. P. A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung* 410, 309, 115-G12 (1993)
- LEVAN, PAUL D. Spatially Resolved Spectra of the Unidentified Infrared Features around HD 44179 (The Red Rectangle). *G. C. Sloan, G. L. Grasdale, & Paul D. LeVan* 409, 412, 102-B3 (1993)
- LEVIN, S. M. Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky* 409, 1, 97-B1 (1993)
- LEVINE, A. Discovery of Orbital Decay in SMC X-1. *A. Levine, S. Rappaport, J. E. Deeter, P. E. Boynton, & F. Nagase* 410, 328, 116-B8 (1993)
- LEWIS, R. S. s-Process Ba Isotopic Compositions in Presolar SiC from the Murchison Meteorite. *C. A. Prohman, F. A. Podosek, S. Amari, & R. S. Lewis* 410, 393, 117-A1 (1993)
- LIEBERT, JAMES. JHK Photometry of WD 0950+139. *Michael S. Fulbright & James Liebert* 410, 275, 115-E1 (1993)

- LIFSCHITZ, ALEXANDER. Local Hydrodynamic Instability of Rotating Stars. *Alexander Lifschitz & Norman Lebovitz*. 408, 603, 92-F9 (1993)
- LIMON, M. Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky*. 409, 1, 97-B1 (1993)
- LIN, D. N. C. Star Trapping and Metallicity Enrichment in Quasars and Active Galactic Nuclei. *Paweł Artymowicz, D. N. C. Lin, & E. Joseph Wampler*. 409, 592, 106-C12 (1993)
- Two-dimensional Viscous Accretion Disk Models. II. On Viscous Overstability. *W. Kley, J. C. B. Papaloizou, & D. N. C. Lin*. 409, 739, 108-C6 (1993)
- LIN, Y. C. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- LINK, BENNETT. Prevalent Properties of Gamma-Ray Burst Variability. *Benneu Link, Richard I. Epstein, & William C. Priedhorsky*. 408, L81, 95-B13 (1993)
- LIVIO, MARIO. The Secondary Maxima in Black Hole X-Ray Nova Light Curves: Clues toward a Complete Picture. *Wan Chen, Mario Livio, & Neil Gehrels*. 408, L5, 88-E8 (1993)
- LOCKWOOD, J. A. Solar Neutron and Proton Production during the 1990 May 24 Cosmic-Ray Flare Increases. *H. Debrunner, J. A. Lockwood, & J. M. Ryan*. 409, 822, 109-D1 (1993)
- LONDON, RICHARD. Hydrodynamics of Winds from Irradiated Companion Stars in Low-Mass X-Ray Binaries. *Marco Tavani & Richard London*. 410, 281, 115-E8 (1993)
- LONG, KNOX S. Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman*. 408, L41, 89-C1 (1993)
- LOPES, ILIDIO. Toward a Unified Classical Model of the Sun: On the Sensitivity of Neutrinos and Helioseismology to the Microscopic Physics. *Sylvaine Turk-Chièze & Ilidio Lopes*. 408, 347, 87-D10 (1993)
- LOW, B. C. Three-dimensional Structures of Magnetostatic Atmospheres. V. Coupled Electric Current Systems. *B. C. Low*. 408, 689, 93-G1 (1993)
- Three-dimensional Structures of Magnetostatic Atmospheres. VI. Examples of Coupled Electric Current Systems. *B. C. Low*. 408, 693, 93-G7 (1993)
- Force-free Magnetic Fields with Singular Current-Density Surfaces. *B. C. Low*. 409, 798, 109-A12 (1993)
- The Free Energies of Partially Open Coronal Magnetic Fields. *B. C. Low & D. F. Smith*. 410, 412, 117-B10 (1993)
- LUBIN, P. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5 Scale near the Star μ Pegasi.
- LUBOW, S. H. Wave Propagation in Accretion Disks: Axisymmetric Case. *S. H. Lubow & J. E. Pringle*. 409, 360, 101-E3 (1993)
- LUO, XIAOCHUN. Kurtosis, Skewness, and Non-Gaussian Cosmological Density Perturbations. *Xiaochun Luo & David N. Schramm*. 408, 33, 83-E1 (1993)
- LUPPINO, GERARD A. Infrared Surface Brightness Fluctuations: K'-Band Observations of M31, M32, and the Distance to Maffei 1. *Gerard A. Luppino & John L. Tonry*. 410, 81, 113-B3 (1993)
- LYNE, A. G. A Young, Glitching Pulsar near the Direction of W28. *V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar*. 409, L57, 111-E1 (1993)
- MACALPINE, G. M. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- MACGREGOR, KEITH B. The Evolution of Angular Momentum among Zero-Age Main-Sequence Solar-Type Stars. *David R. Soderblom, John R. Stauffer, Keith B. MacGregor, & Burton F. Jones*. 409, 624, 106-F13 (1993)
- MADAU, PIERO. Self-absorbed Active Galactic Nuclei and the Cosmic X-Ray Background. *Piero Madau, Gabriele Ghisellini, & A. C. Fabian*. 410, L7, 117-F8 (1993)
- MAGNANI, LORIS. CH as a Tracer of a Translucent Cloud Boundary. *Loris Magnani & Joseph S. Onello*. 408, 559, 92-B9 (1993)
- MAJEWSKI, S. R. Star Counts Redivivus. I. A New Look at the Galaxy at Faint Magnitudes. *Neill Reid & S. R. Majewski*. 409, 635, 106-G12 (1993)
- MAKISHIMA, K. X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai*. 409, 155, 98-G9 (1993)
- MALKAN, M. A. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- The High-Energy Diffuse Cosmic Gamma-Ray Background Radiation from Blazars. *F. W. Stecker, M. H. Salamon, & M. A. Malkan*. 410, L71, 125-F5 (1993)
- MAMON, GARY A. The Formation of Cyanopolyyne Molecules in IRC +10216. *Isabelle Cherchneff, Alfred E. Glassgold, & Gary A. Mamon*. 410, 188, 114-D12 (1993)
- MANCHESTER, R. N. A Young, Glitching Pulsar near the Direction of W28. *V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar*. 409, L57, 111-E1 (1993)
- MANGUM, J. G. Extended CO(7-6) Emission from Warm Gas in Orion. *J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey*. 410, 179, 114-D1 (1993)
- MANGUM, JEFFREY G. The Physical Structure of Orion-KL on 2500 AU Scales Using the K-Douplet Transitions of Formaldehyde. *Jeffrey G. Mangum, Alwyn Wootten, & Richard L. Plambeck*. 409, 282, 100-E13 (1993)
- MAOZ, D. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars. *D. Maoz, J. N. Bahcall, D. P. Schneider, N. A. Bahcall, S. Djorgovski, R. Doxsey, A. Gould, S. Kirhakos, G. Meylan, & B. Yanny*. 409, 28, 97-D1 (1993)
- MARAN, S. P. See MICHALITSIANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- MARASCHI, L. A Spectral Study of Four X-Ray-selected BL Lacertae Objects with EXOSAT. *R. M. Sambruna, P. Barr, L. Maraschi, G. Tagliaferri, & A. Treves*. 408, 452, 90-G1 (1993)
- MARLBOROUGH, J. M. Dynamics of the Envelopes of Be Stars and Shell Stars in the Equatorial Plane: A Potential Similarity and Difference Based upon the Continuous Energy Distribution. *J. M. Marlborough, Haiqi Chen, & L. B. F. M. Waters*. 408, 646, 93-C1 (1993)
- MARSHALL, F. E. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- MARSHALL, JENNIFER. Highly Blueshifted H I Gas toward the Galactic Center. *Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall*. 410, L27, 118-G12 (1993)
- MARTIN, P. G. Interstellar Extinction in the Infrared: The Molecular Cloud toward HD 62542. *D. C. B. Whittet, P. G. Martin, E. L. Fitzpatrick, & D. Massa*. 408, 573, 92-C11 (1993)
- MARZIANI, P. The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston*. 410, 56, 112-G4 (1993)
- MARZIANI, PAOLO. Evidence for a Very Broad Line Region in PG 1138+222. *Paolo Marziani & Jack W. Sulentic*. 409, 612, 106-E10 (1993)
- MASON, G. M. Magnetic Field Power Density Spectra during "Scatter-free" Solar Particle Events. *L. C. Tan & G. M. Mason*. 409, L29, 104-E1 (1993)
- MASSA, D. Interstellar Extinction in the Infrared: The Molecular Cloud toward HD 62542. *D. C. B. Whittet, P. G. Martin, E. L. Fitzpatrick, & D. Massa*. 408, 573, 92-C11 (1993)

- MATILSKY, T. A. Ultraviolet Properties of Individual Hot Stars in Globular Cluster Cores. I. NGC 1904 (M79). *B. Altner & T. A. Matilsky*. 410, 116, 113-E8 (1993)
- MATSUHARA, H. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- MATSUMOTO, T. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- MATSUURA, S. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- MATTHEWS, H. E. Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Matthews, R. Wade, & W. D. Duncan*. 410, 650, 121-F11 (1993)
- MATTHEWS, K. H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith*. 408, L105, 95-F1 (1993)
- MATTOX, J. R. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the *Compton Gamma Ray Observatory*.
See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the *Compton Gamma-Ray Observatory*.
See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
The EGRET Detection of Quasar 1633+382. *J. R. Mattox, D. L. Bertsch, J. Chiang, B. L. Dingus, C. E. Fichtel, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, P. L. Nolan, K. Pinkau, E. Schneid, P. Sreekumar, & D. J. Thompson*. 410, 609, 121-C5 (1993)
- MAUSKOPF, P. D. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- MAYER-HASSELWANDER, H. A. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the *Compton Gamma Ray Observatory*.
See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the *Compton Gamma-Ray Observatory*.
See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- MAZZARELLA, J. M. Molecular Gas in Powerful Radio Galaxies Detected by IRAS. *J. M. Mazzarella, J. R. Graham, D. B. Sanders, & S. Djorgovski*. 409, 170, 99-A13 (1993)
- MCCALL, MARSHALL L. Ar/S. *Christopher C. Stevenson, Marshall L. McCall, & Douglas L. Welch*. 408, 460, 90-G11 (1993)
- MCCAMMON, D. The X-Ray Shadow of the High-Latitude Molecular Cloud MBM 12. *S. L. Snowden, D. McCammon, & F. Verter*. 409, L21, 104-D1 (1993)
- MCCAUGHREAN, MARK J. Near-Infrared Discovery of the L810 Nebula Illuminator. *João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke*. 408, L101, 95-E9 (1993)
- MCCOULAND, R. J. H. LSIV -12°11': A Candidate Halo Proto-Planetary Nebula. *E. S. Conlon, P. L. Dufton, R. J. H. McCauland, & F. P. Keenan*. 408, 593, 92-E11 (1993)
- MCCLEMENTS, K. G. Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer*. 409, 465, 102-F9 (1993)
- MCCRAY, RICHARD. On the Origin of the Soft X-Ray Background. *Q. Daniel Wang & Richard McCray*. 409, L37, 111-B8 (1993)
- MCDOWELL, J. Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell*. 410, 29, 112-D11 (1993)
- MCLAUGHLIN, BRENDAN M. Effective Collision Strengths for O II. *Brendan M. McLaughlin & Kenneth L. Bell*. 408, 753, 94-E3 (1993)
- MCLAUGHLIN, DEAN E. Globular Clusters and cD Formation: The Case of M87. *Dean E. McLaughlin, William E. Harris, & David A. Hanes*. 409, L45, 111-C8 (1993)
- MEDIAVILLA, E. The Circumnuclear Region of NGC 5728. *S. Arribas & E. Mediavilla*. 410, 552, 120-E5 (1993)
- MEI, SIMONA. Tilted Cold Dark Matter Models Confront the Cosmic Microwave Background and the Galaxy Peculiar Velocity Field. *Pio Francesco Muciaccia, Simona Mei, Giancarlo de Gasperis, & Nicola Vittorio*. 410, L61, 125-E7 (1993)
- MEINHOLD, P. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5 Scale near the Star μ Pegasi. *P. Meinhold, A. Clapp, M. Devlin, M. Fischer, J. Gundersen, W. Holmes, A. Lange, P. Lubin, P. Richards, & G. Smoot*. 409, L1, 104-A8 (1993)
- MELIA, FULVIO. Understanding Soft Gamma-Ray Repeaters in the Context of the Extragalactic Radio Pulsar Origin of Gamma-Ray Bursts. *Fulvio Melia & Marco Fatuzzo*. 408, L9, 88-F1 (1993)
- MELOTT, ADRIAN L. Controlled Experiments in Cosmological Gravitational Clustering. *Adrian L. Melott & Sergei F. Shandarin*. 410, 469, 119-E1 (1993)
- MENDES DE OLIVEIRA, C. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- MERRITT, DAVID. Mapping Spherical Potentials with Discrete Radial Velocities. *David Merritt & Prasenjit Saha*. 409, 75, 97-G10 (1993)
- MEYER, DAVID M. The Interstellar $^7\text{Li}/^6\text{Li}$ Isotope Ratio toward ζ Ophiuchi and ζ Persei. *David M. Meyer, Isabel Hawkins, & Edward L. Wright*. 409, L61, 111-E8 (1993)
- MEYER, STEPHAN. Cross-Correlation between the 170 GHz Survey Map and the COBE Differential Microwave Radiometer First-Year Maps. *Ken Ganga, Ed Cheng, Stephan Meyer, & Lyman Page*. 410, L57, 125-E1 (1993)
- MEYLAN, G. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- MEZZACAPPA, ANTHONY. Stellar Core Collapse: A Boltzmann Treatment of Neutrino-Electron Scattering. *Anthony Mezzacappa & Stephen W. Bruenn*. 410, 740, 123-A7 (1993)
- MICHALITSANOS, A. G. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560. *A. G. Michalitsianos, M. Perez, S. N. Shore, S. P. Maran, M. Karovska, G. Sonneborn, J. R. Webb, Thomas G. Barnes III, Marian L. Fruch, R. J. Olferssen, & S. G. Starrfield*. 409, L53, 111-D8 (1993)
- MICHAUD, G. Light-induced Drift and Abundance Anomalies. *F. LeBlanc & G. Michaud*. 408, 251, 86-C1 (1993)
- MICHELSON, P. F. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the *Compton Gamma Ray Observatory*.
See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the *Compton Gamma-Ray Observatory*.
See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- MIDDLEDITCH, J. The Binary Pulsar PSR 1908+00 in NGC 6760. *W. T. S. Deich, J. Middleditch, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan*. 410, L95, 126-A13 (1993)
- MIDDLEDITCH, JOHN. Low-Mass X-Ray Binaries and Millisecond Pulsars in Globular Clusters. *Kaiyou Chen, John Middleditch, & Malvin Ruderman*. 408, L17, 88-G1 (1993)
- MILLER, M. D. Theoretical Infrared Spectra of Some Model Polycyclic Aromatic Hydrocarbons: Effect of Ionization. *D. J. DeFrees, M. D. Miller, D. Talbi, F. Pauzat, & Y. Ellinger*. 408, 530, 91-G5 (1993)
- MILLER, WARNER A. Tidal Disruptions by Supermassive Black Holes: Hydrodynamic Evolution of Stars on a Schwarzschild Background. *Pablo Laguna, Warner A. Miller, Wojciech H. Zurek, & Melvyn B. Davies*. 410, L83, 125-G9 (1993)
- MINESHIGE, SHIN. Large-Scale Explosions and Superbubbles in the Galactic Disk and Halo. I. Magnetohydrodynamic Simulations. *Shin Mineshige, Kazunari Shibata, & Paul R. Shapiro*. 409, 663, 107-C1 (1993)
- MINNITI, DANTE. The Bulge of M33. *Dante Minniti, Edward W. Olszewski, & Marcia Rieke*. 410, L79, 125-G3 (1993)

- MIZUNO, A. See SKRUTSKIE, M. F., et al. Detection of Circumstellar Gas Associated with GG Tauri.
- MO, H. J. Quasar Clustering on Large Scales. *H. J. Mo & L. Z. Fang*. 410, 493, 119-G1 (1993)
- MOFFAT, A. F. J. Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Pirola*. 410, 342, 116-C10 (1993)
- MOFFETT, DAVID A. Deep VLA Imaging of Pulsar-powered Nebulae and the Beaming Fraction of Young Pulsars. *Dale A. Frail & David A. Moffett*. 408, 637, 93-B5 (1993)
- MOLES, M. The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston*. 410, 56, 112-G4 (1993)
- MOLINARI, EMILIO. Galaxy Colors in Distant Clusters as a Test for the World Model. *Alberto Buzzoni, Guido Chincarini, & Emilio Molinari*. 410, 499, 119-G9 (1993)
- MØLLER, P. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- MORRIS, D. VLA Observations of 1E 1740.7-2942: A Search for Radio Recombination Lines of Positronium. *K. R. Anantharamaiah, K. S. Dwarakanath, D. Morris, W. M. Goss, & V. Radhakrishnan*. 410, 110, 113-E1 (1993)
- MORRIS, MARK. Massive Star Formation near the Galactic Center and the Fate of the Stellar Remnants. *Mark Morris*. 408, 496, 91-D1 (1993)
- Radio and X-Ray Observations of OH 231.8+4.2. *Gregory B. Taylor & Mark Morris*. 409, 720, 108-A9 (1993)
- MORRIS, S. C. Hubble Space Telescope Spectra of the Phase-modulated Wind in the SMC O+WR Binary R31. *J. B. Hutchings, L. Bianchi, & S. C. Morris*. 410, 803, 123-F10 (1993)
- MORSE, JON A. The Bow Shock and Mach Disk of HH 111V. *Jon A. Morse, Steve Heathcote, Gerald Cecil, Patrick Hartigan, & John C. Raymond*. 410, 764, 123-C5 (1993)
- MOSELEY, S. H. High-Resolution Mid-Infrared Spectra of Co II, Ni I, and Fe II in SN 1987A. *D. E. Jennings, R. J. Boyle, G. R. Wiedemann, & S. H. Moseley*. 408, 277, 86-E5 (1993)
- MOSS, DAVID. Models for the Magnetic Field of M81. *David Moss, Axel Brandenburg, Karl Johan Donner, & Magnus Thomasson*. 409, 179, 99-B10 (1993)
- MOULD, J. R. The Age of the Large Magellanic Cloud Cluster NGC 2031. *J. R. Mould, D. A. Xystus, & G. S. Da Costa*. 408, 108, 84-D8 (1993)
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer*. 409, 14, 97-C1 (1993)
- MUCIACCIA, PIO FRANCESCO. Tilted Cold Dark Matter Models Confront the Cosmic Microwave Background and the Galaxy Peculiar Velocity Field. *Pio Francesco Muciaccia, Simona Mei, Giancarlo de Gasperis, & Nicola Vittorio*. 410, L61, 125-E7 (1993)
- MURAKAMI, AKINORI. Laboratory Detection of C₅S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Ohi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami*. 410, L45, 118-D11 (1993)
- MURAKAMI, IZUMI. On the Origin of H I Absorption Systems of Quasars. *Izumi Murakami & Satoru Ikeuchi*. 409, 42, 97-E1 (1993)
- MURTHY, J. Voyager 2 Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murthy, A. Dring, & R. C. Henry*. 410, 714, 122-E13 (1993)
- MURTHY, JAYANT. Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance*. 408, L97, 95-E3 (1993)
- MUSHOTSKY, R. F. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- MUSIELAK, Z. E. The Cutoff Frequency for Fast-Mode Magnetohydrodynamic Waves in an Isothermal Atmosphere with a Uniform Horizontal Magnetic Field. *B. A. Stark & Z. E. Musielak*. 409, 450, 102-E5 (1993)
- MYERS, P. C. An Infrared Survey for Embedded Young Stars in the Perseus Molecular Cloud Complex. *E. F. Ladd, E. A. Lada, & P. C. Myers*. 410, 168, 114-C1 (1993)
- NAGASE, F. The Discovery of Pulsed Iron Line Emission from Centaurus X-3. *C. S. R. Day, F. Nagase, K. Asai, & T. Takeshima*. 408, 656, 93-D1 (1993)
- Discovery of Orbital Decay in SMC X-1. *A. Levine, S. Rappaport, J. E. Deeter, P. E. Boynton, & F. Nagase*. 410, 328, 116-B8 (1993)
- NAGASHIMA, UMPEI. An Ab Initio Prediction of the Spectroscopic Constants of MgNC: The First Mg-bearing Molecule in Space. *Keisaku Ishii, Tsuneo Hirano, Umpei Nagashima, Bernhard Weis, & Koichi Yamashita*. 410, L43, 118-D7 (1993)
- NAKAI, N. X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai*. 409, 155, 98-G9 (1993)
- NARAYAN, RAMESH. Imaging with Ultra-Resolution in the Presence of Strong Scattering. *T. J. Cornwell & Ramesh Narayan*. 408, L68, 89-G1 (1993)
- NARLIKAR, J. V. A Quasi-Steady State Cosmological Model with Creation of Matter. *F. Hoyle, G. Burbidge, & J. V. Narlikar*. 410, 437, 119-B7 (1993)
- NEL, H. I. See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- NETZER, H. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverly J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne*. 410, 534, 120-C11 (1993)
- NETZER, NATHAN. The Dynamics of Stellar Outflows Dominated by Interaction of Dust and Radiation. *Nathan Netzer & Moshe Elitzur*. 410, 701, 122-D11 (1993)
- NEUGEBAUER, G. H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith*. 408, L105, 95-F1 (1993)
- NICE, D. See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- NISSEN, POUL E. The ⁶Li/⁷Li Ratio in the Metal-poor Halo Dwarfs HD 19445 and HD 84937. *Verne V. Smith, David L. Lambert, & Poul E. Nissen*. 408, 262, 86-D1 (1993)
- NOLAN, P. L. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory. *P. L. Nolan, Z. Arzoumanian, D. L. Bertsch, J. Chiang, C. E. Fichtel, J. M. Fierro, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, H. I. Nel, D. Nice, K. Pinkau, H. Roithermel, E. Schneid, M. Sommer, P. Sreekumar, J. H. Taylor, & D. J. Thompson*. 409, 697, 107-F8 (1993)
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- NOMOTO, KEN'ICHI. Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibasaki, Ken'ichi Nomoto, & Sachiko Tsuruta*. 408, 186, 85-D7 (1993)
- NORDLUND, ÅKE. Ionization Effects in Three-dimensional Solar Granulation Simulations. *Mark P. Rast, Åke Nordlund, Robert F. Stein, & Juri Toomre*. 408, L53, 89-D11 (1993)
- NORIEGA-CRESPO, A. A New Herbig-Haro Flow in the HH 1-2 Complex. *Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga*. 408, L49, 89-D1 (1993)

- NORMAN, COLIN. Galactic Bars with Central Mass Concentrations: Three-dimensional Dynamics. *Hashima Hasan, Daniel Pfenniger, & Colin Norman*. 409, 91, 98-B1 (1993)
- NORMAN, DARA J. The Galactic Halo and Local Intergalactic Medium toward PKS 2155-304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo*. 409, 199, 99-D6 (1993)
- NOTA, ANTONELLA. Coronagraphic Imaging of the Bipolar Nebula around the Luminous Blue Variable R127. *Mark Clampin, Antonella Nota, David A. Golimowski, Claus Leitherer, & Samuel T. Durrance*. 410, L35, 118-C5 (1993)
- OBİ, KINICHI. Laboratory Detection of C_5S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Obi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami*. 410, L45, 118-D11 (1993)
- O'DELL, C. R. Motion in the Orion Nebula: A Kinematic Study of [S III]. *Zheng Wen & C. R. O'Dell*. 409, 262, 100-D1 (1993)
- Discovery of New Objects in the Orion Nebula on HST Images: Shocks, Compact Sources, and Protoplanetary Disks. *C. R. O'Dell, Zheng Wen, & Xihai Hu*. 410, 696, 122-C11 (1993)
- O'DONOGHUE, AILEEN A. Flow Dynamics and Bending of Wide-Angle Tailed Radio Sources. *Aileen A. O'Donoghue, Jean A. Eilek, & Frazer N. Owen*. 408, 428, 90-E1 (1993)
- ÖGELMAN, HAKKI. ROSAT Observations of the Large Magellanic Cloud Pulsar PSR 0540-69. *John P. Finley, Hakki Ögelman, Günther Hasinger, & Joachim Trümper*. 410, 323, 116-B1 (1993)
- OH, J. J. Rotational Spectra of the $X^2\Sigma^+$ States of CaH and CaD. *C. I. Frum, J. J. Oh, E. A. Cohen, & H. M. Pickett*. 408, L61, 89-F1 (1993)
- OHASHI, N. See SKRUTSKIE, M. F., et al. Detection of Circumstellar Gas Associated with GG Tauri.
- OHASHI, T. X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai*. 409, 155, 98-G9 (1993)
- OHSHIMA, YASUHIRO. Laboratory Detection of a New Free Radical C_4S ($^3\Sigma^-$). *Yasuhiro Hirahara, Yasuhiro Ohshima, & Yasuki Endo*. 408, L113, 95-F13 (1993)
- Laboratory Detection of C_5S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Obi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami*. 410, L45, 118-D11 (1993)
- OKA, T. Detection of H_2^+ Infrared Emission Lines in Saturn. *T. R. Geballe, M.-F. Jagod, & T. Oka*. 408, L109, 95-F7 (1993)
- OLIVER, R. Oscillations of a Quiescent Solar Prominence Embedded in a Hot Corona. *R. Oliver, J. L. Ballester, A. W. Hood, & E. R. Priest*. 409, 809, 109-B12 (1993)
- OLIVERSEN, R. J. See MICHALITSIANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- OLIVIER, SCOT S. Significant Cluster Correlations at $30 h^{-1}$ Mpc: Can Standard Models Be Ruled Out? *Scot S. Olivier, Joel R. Primack, George R. Blumenthal, & Avishai Dekel*. 408, 17, 83-C7 (1993)
- OLSZEWSKI, EDWARD W. The Bulge of M33. *Dante Minniti, Edward W. Olszewski, & Marcia Rieke*. 410, L79, 125-G3 (1993)
- ONELLO, JOSEPH S. CH as a Tracer of a Translucent Cloud Boundary. *Loris Magnani & Joseph S. Onello*. 408, 559, 92-B9 (1993)
- OPHER, R. Mass Loss from Wolf-Rayet Stars Due to Radiation Pressure and Alfvén Waves. *L. C. dos Santos, V. Jatenco-Pereira, & R. Opher*. 410, 732, 122-G11 (1993)
- ORTOLANI, S. Field Color-Magnitude Diagram Analysis along the Bulge Major Axis. *S. Ortolani, E. Bica, & B. Barbuy*. 408, L29, 89-A8 (1993)
- OSAKI, Y. Asymmetries of Solar Oscillation Line Profiles. *T. L. Duvall, Jr., S. M. Jefferies, J. W. Harvey, Y. Osaki, & M. A. Pomerantz*. 410, 829, 124-A13 (1993)
- OSTRIKER, JEREMIAH P. The Cosmic Mach Number: Direct Comparisons of Observations and Models. *Michael A. Strauss, Renyue Cen, & Jeremiah P. Ostriker*. 408, 389, 90-B1 (1993)
- Postcollapse Evolution of Globular Clusters Dominated by Tidal Binary Heating. *Hyung Mok Lee & Jeremiah P. Ostriker*. 409, 617, 106-F3 (1993)
- OWEN, FRAZER N. Flow Dynamics and Bending of Wide-Angle Tailed Radio Sources. *Aileen A. O'Donoghue, Jean A. Eilek, & Frazer N. Owen*. 408, 428, 90-E1 (1993)
- OWEN, J. MICHAEL. Imaging Spectrophotometry of the Orion Nebula Core. I. Emission-Line Mapping and Physical Conditions: Erratum. *Richard W. Pogge, J. Michael Owen, & Bruce Atwood*. 408, 758, 94-E9 (1993) (Orig. paper in 399, 147, 197-A9 (1992))
- PADMANABHAN, T. Zel'dovich Approximation and the Probability Distribution for the Smoothed Density Field in the Nonlinear Regime. *T. Padmanabhan & K. Subramanian*. 410, 482, 119-F1 (1993)
- PAGE, LYMAN. Cross-Correlation between the 170 GHz Survey Map and the COBE Differential Microwave Radiometer First-Year Maps. *Ken Ganga, Ed Cheng, Stephan Meyer, & Lyman Page*. 410, L57, 125-E1 (1993)
- PALMER, DAVID M. An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7-2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone*. 408, 507, 91-E7 (1993)
- PANAGIA, NINO. The Radio Emission from the Type Ic Supernova SN 1990B. *Schuyler D. Van Dyk, Richard A. Sramek, Kurt W. Weiler, & Nino Panagia*. 409, 162, 99-A3 (1993)
- PAPALOIZOU, J. C. B. Two-dimensional Viscous Accretion Disk Models. II. On Viscous Overstability. *W. Kley, J. C. B. Papaloizou, & D. N. C. Lin*. 409, 739, 108-C6 (1993)
- PARKER, E. N. A Solar Dynamo Surface Wave at the Interface between Convection and Nonuniform Rotation. *E. N. Parker*. 408, 707, 94-A9 (1993)
- PARKER, JOEL WM. A New Luminous Blue Variable: R143 in 30 Doradus. *Joel Wm. Parker, Geoffrey C. Clayton, Cláudia Winge, & Peter S. Conti*. 409, 770, 108-F3 (1993)
- PARMEGGIANI, G. See BENDINELLI, O., et al. The First Detection of a Collapsed Core Globular Cluster in M31.
- PAUZAT, F. Theoretical Infrared Spectra of Some Model Polycyclic Aromatic Hydrocarbons: Effect of Ionization. *D. J. De Frees, M. D. Miller, D. Talbi, F. Pauzat, & Y. Ellinger*. 408, 530, 91-G5 (1993)
- PENFOLD, J. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- PENG, YUN-LOU. A Flattened Cloud Core in NGC 2024. *Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó*. 408, 565, 92-C1 (1993)
- PENSTON, M. V. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston*. 410, 56, 112-G4 (1993)
- PENZIAS, ARNO A. $^{12}C/^{13}C$ Isotope Ratio in the Local Interstellar Medium from Observations of $^{13}C^{18}O$ in Molecular Clouds. *William D. Langer & Arno A. Penzias*. 408, 539, 92-A1 (1993)
- PÉREZ, E. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston*. 410, 56, 112-G4 (1993)
- PEREZ, M. See MICHALITSIANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- PETERS, GERALDINE J. A Giant X-Ray Flare on λ Eridani (B2e). *Myron A. Smith, Carol A. Grady, Geraldine J. Peters, & Eric D. Feigelson*. 409, L49, 111-D1 (1993)
- PETERSOHN, J. K. Voyager 2 Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B.*

- Holberg, J. Murthy, A. Dring, & R. C. Henry. 410, 714, 122-E13 (1993)
- PETERSON, B. M. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- PETRE, R. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- PFEENIGER, DANIEL. Galactic Bars with Central Mass Concentrations: Three-dimensional Dynamics. Hashima Hasan, Daniel Pfenniger, & Colin Norman. 409, 91, 98-B1 (1993)
- PHILLIPS, JOHN G. On the Carrier of the Band at 700 Nanometers in the Iron Hydride Spectrum. John G. Phillips & Sumner P. Davis. 409, 860, 109-G9 (1993)
- PHILLIPS, ROBERT B. VLBI Astrometric Identification of the Radio-emitting Region in Algol and Determination of the Orientation of the Close Binary. Jean-François Lestrade, Robert B. Phillips, Mark W. Hodges, & Robert A. Preston. 410, 808, 123-G1 (1993)
- PHILLIPS, T. High-Resolution Measurements, Line Identification, and Spectral Modeling of $K\alpha$ Transitions in Fe XVIII-Fe XXV. P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn. 409, 846, 109-F6 (1993)
- PHILLIPS, T. G. Circumstellar Shells Resolved in IRAS Survey Data. II. Analysis. K. Young, T. G. Phillips, & G. R. Knapp. 409, 725, 108-B3 (1993)
- PICKETT, H. M. Rotational Spectra of the $X^2\Sigma^+$ States of CaH and CaD. C. I. Frum, J. J. Oh, E. A. Cohen, & H. M. Pickett. 408, L61, 89-F1 (1993)
- PIIROLA, V. Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Piirola. 410, 342, 116-C10 (1993)
- The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. V. Piirola, P. Hakala, & G. V. Coyne, S. J. 410, L107, 126-C3 (1993)
- PINES, DAVID. Postglitch Relaxation of the Vela Pulsar after Its First Eight Large Glitches: A Reevaluation with the Vortex Creep Model. M. Ali Alpar, H. F. Chau, K. S. Cheng, & David Pines. 409, 345, 101-D1 (1993)
- PINKAU, K. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- PIRAN, T. Void Evolution and the Large-Scale Structure. John Dubinski, L. Nicolaci da Costa, D. S. Goldwirth, M. Lecar, & T. Piran. 410, 458, 119-D1 (1993)
- PLAMBECK, RICHARD L. The Physical Structure of Orion-KL on 2500 AU Scales Using the K-Doublet Transitions of Formaldehyde. Jeffrey G. Mangum, Alwyn Wootten, & Richard L. Plambeck. 409, 282, 100-E13 (1993)
- PODOSEK, F. A. s-Process Ba Isotopic Compositions in Presolar SiC from the Murchison Meteorite. C. A. Prombo, F. A. Podosek, S. Amari, & R. S. Lewis. 410, 393, 117-A1 (1993)
- POGGE, R. W. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- POGGE, RICHARD W. Imaging Spectrophotometry of the Orion Nebula Core. I. Emission-Line Mapping and Physical Conditions: Erratum. Richard W. Pogge, J. Michael Owen, & Bruce Atwood. 408, 758, 94-E9 (1993) (Orig. paper in 399, 147, 197-A9 (1992))
- POGGIANTI, BIANCA MARIA. Evolution of Elliptical Galaxies. I. The Multiphase Model. Federico Ferrini & Bianca Maria Poggianti. 410, 44, 112-F4 (1993)
- POLIDAN, RONALD S. Dynamic Processes in Be Star Atmospheres. I. "Dimple" Formation in the He sci $\lambda 6678$ Line of λ Eridani. Myron A. Smith & Ronald S. Polidan. 408, 323, 87-B8 (1993)
- POMERANTZ, M. A. Asymmetries of Solar Oscillation Line Profiles. T. L. Duvall, Jr., S. M. Jefferies, J. W. Harvey, Y. Osaki, & M. A. Pomerantz. 410, 829, 124-A13 (1993)
- POSTMAN, MARC. The Shapes of Brightest Cluster Galaxies. Barbara S. Ryden, Tod R. Lauer, & Marc Postman. 410, 515, 120-B1 (1993)
- PRADHAN, ANIL K. New Excitation Rates and Line Ratios for [Fe II]. Anil K. Pradhan & Hong Lin Zhang. 409, L77, 111-G8 (1993)
- PRESTON, ROBERT A. VLBI Astrometric Identification of the Radio-emitting Region in Algol and Determination of the Orientation of the Close Binary. Jean-François Lestrade, Robert B. Phillips, Mark W. Hodges, & Robert A. Preston. 410, 808, 123-G1 (1993)
- PRIEDHORSKY, WILLIAM C. Prevalent Properties of Gamma-Ray Burst Variability. Bennett Link, Richard I. Epstein, & William C. Priedhorsky. 408, L81, 95-B13 (1993)
- PRIEST, E. R. Oscillations of a Quiescent Solar Prominence Embedded in a Hot Corona. R. Oliver, J. L. Ballester, A. W. Hood, & E. R. Priest. 409, 809, 109-B12 (1993)
- PRIMACK, JOEL R. Significant Cluster Correlations at $30 h^{-1}$ Mpc: Can Standard Models Be Ruled Out? Scot S. Olivier, Joel R. Primack, George R. Blumenthal, & Avishai Dekel. 408, 17, 83-C7 (1993)
- PRIMINI, F. A. High-Resolution X-Ray Observations of the Central Region of M31 with the ROSAT Satellite. F. A. Primini, W. Forman, & C. Jones. 410, 615, 121-C12 (1993)
- PRINCE, T. A. The Binary Pulsar PSR 1908+00 in NGC 6760. W. T. S. Deich, J. Middleditch, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan. 410, L95, 126-A13 (1993)
- PRINCE, THOMAS A. An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7-2942, with the Caltech Coded-Aperture Telescope. William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone. 408, 507, 91-E7 (1993)
- PRINGLE, J. E. Wave Propagation in Accretion Disks: Axisymmetric Case. S. H. Lubow & J. E. Pringle. 409, 360, 101-E3 (1993)
- PROMBO, C. A. s-Process Ba Isotopic Compositions in Presolar SiC from the Murchison Meteorite. C. A. Prombo, F. A. Podosek, S. Amari, & R. S. Lewis. 410, 393, 117-A1 (1993)
- PUDRITZ, RALPH E. The Origin of Forbidden Line Emission from Young Stellar Objects. Ana I. Gomez de Castro & Ralph E. Pudritz. 409, 748, 108-D3 (1993)
- RADECKE, H.-D. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- RADHAKRISHNAN, V. VLA Observations of 1E 1740.7-2942: A Search for Radio Recombination Lines of Positronium. K. R. Anantharamaiah, K. S. Dwarakanath, D. Morris, W. M. Goss, & V. Radhakrishnan. 410, 110, 113-E1 (1993)
- RAGA, A. C. A New Herbig-Haro Flow in the HH 1-2 Complex. Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga. 408, L49, 89-D1 (1993)
- RAITERI, C. M. Carbon Stars and Isotopic Ba Anomalies in Meteoritic SiC Grains. R. Gallino, C. M. Raiteri, & M. Busso. 410, 400, 117-A10 (1993)
- RAND, RICHARD J. Density Wave Kinematics and Giant Molecular Association Formation in M51. Richard J. Rand. 410, 68, 113-A3 (1993)
- RANK, DAVID. Spectral Imaging of the 3.3 and 11.3 Micron Emission Bands in NGC 1333: Discovery of Spatially Separate Band Emissions. Jesse Bregman, David Rank, Scott A. Sandford, & Pasquale Temi. 410, 668, 122-A5 (1993)
- RAPPAPORT, S. Discovery of Orbital Decay in SMC X-1. A. Levine, S. Rappaport, J. E. Deeter, P. E. Boynton, & F. Nagase. 410, 328, 116-B8 (1993)
- RAST, MARK P. Ionization Effects in Three-dimensional Solar Granulation Simulations. Mark P. Rast, Ake Nordlund, Robert F. Stein, & Juri Toomre. 408, L53, 89-D11 (1993)
- RATHNASREE, N. Reddening Errors and the Post-Main-Sequence Distribution of Stars in the H-R Diagram of the Large Magellanic Cloud. N. Rathnasree. 410, L99, 126-B5 (1993)

- RAWLINGS, STEVE. An Optically Luminous Radio Galaxy at $z = 3.22$ and the $K-z$ Diagram at High Redshift. *Stephen A. Eales, Steve Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy.* 409, 578, 106-B7 (1993)
- RAYMOND, JOHN. The Formation and Evolution of Shocks in Stellar Jets from a Variable Wind. *Patrick Hartigan & John Raymond.* 409, 705, 107-G5 (1993)
- RAYMOND, JOHN C. The Bow Shock and Mach Disk of HH 111V. *Jon A. Morse, Steve Heathcote, Gerald Cecil, Patrick Hartigan, & John C. Raymond.* 410, 764, 123-C5 (1993)
- REFFO, G. The s -Process between $A = 120$ and 124: Signature of Neutron Density and Temperature in Red Giants. *F. Käppeler, W. Schanz, K. Wisshak, & G. Reffo.* 410, 370, 116-F3 (1993)
- REID, NEILL. Star Counts Redivivus. I. A New Look at the Galaxy at Faint Magnitudes. *Neill Reid & S. R. Majewski.* 409, 635, 106-G12 (1993)
- REIPURTH, BO. A New Herbig-Haro Flow in the HH 1-2 Complex. *Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga.* 408, L49, 89-D1 (1993)
- RENZINI, ALVIO. Search for Ionized Cores in Proto-Planetary Nebulae, and the Asymptotic Giant Branch to Planetary Nebula Transition. *Hans Ulrich Käufl, Alvio Renzini, & Letizia Stanghellini.* 410, 251, 115-C1 (1993)
- RESTAINO, SERGIO R. Observation of Impulsive Acoustic Events and the Excitation of Solar Oscillations. *Sergio R. Restaino, Robin T. Stebbins, & Philip R. Goode.* 408, L57, 89-E9 (1993)
- RICHARDS, P. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5° Scale near the Star μ Pegasi.
- RICHARDS, P. L. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- RICHMOND, M. W. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- RIEKE, MARCIA. Near-Infrared Discovery of the L810 Nebula Illuminator. *João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke.* 408, L101, 95-E9 (1993)
- The Bulge of M33. *Dante Minniti, Edward W. Olszewski, & Marcia Rieke.* 410, L79, 125-G3 (1993)
- ROBERTS, D. H. Is 1308+326 a BL Lacertae Object or a Quasar? *D. C. Gabuzda, R. I. Kollgaard, D. H. Roberts, & J. F. C. Wardle.* 410, 39, 112-E12 (1993)
- ROBINSON, P. A. Dynamics of Langmuir and Ion-Sound Waves in Type III Solar Radio Sources. *P. A. Robinson, A. J. Willes, & I. H. Cairns.* 408, 720, 94-B9 (1993)
- ROCHE, P. F. An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright.* 409, 404, 102-A8 (1993)
- RODRÍGUEZ, L. F. Further Studies on the Champagne Phase of GM 24 (IRAS 17136-3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho.* 409, 269, 100-D10 (1993)
- RODRÍGUEZ, LUIS F. A Flattened Cloud Core in NGC 2024. *Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó.* 408, 565, 92-C1 (1993)
- From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. *José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó.* 410, 202, 114-F1 (1993)
- ROOD, ROBERT T. On Partial Mixing Zones in Horizontal-Branch Stellar Cores. *Ben Dorman & Robert T. Rood.* 409, 387, 101-G3 (1993)
- ROOS, NICO. A Massive Binary Black Hole in 1928+738? *Nico Roos, Jelle S. Kaastra, & Christian A. Hummel.* 409, 130, 98-E8 (1993)
- ROSENBLATT, E. I. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- ROSNER, R. On the Thermal Stability of a Radiating Plasma Subject to Nonlocal Thermal Conduction. I. Linear Analysis. *E. Chun & R. Rosner.* 408, 678, 93-F1 (1993)
- ROTH, J. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer.* 409, 14, 97-C1 (1993)
- ROTH, M. A New Herbig-Haro Flow in the HH 1-2 Complex. *Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga.* 408, L49, 89-D1 (1993)
- Further Studies on the Champagne Phase of GM 24 (IRAS 17136-3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho.* 409, 269, 100-D10 (1993)
- ROTHERMEL, H. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- RUDEMAN, MALVIN. Origin and Radio Pulse Properties of Millisecond Pulsars. *Kaiyou Chen & Malvin Ruderman.* 408, 179, 85-C12 (1993)
- Low-Mass X-Ray Binaries and Millisecond Pulsars in Globular Clusters. *Kaiyou Chen, John Middledich, & Malvin Ruderman.* 408, L17, 88-G1 (1993)
- RUDNICK, LAWRENCE. Spatial Spectral Index Variations in Galactic Shell Supernova Remnants G39.2-0.3 and G41.1-0.3. *Martha C. Anderson & Lawrence Rudnick.* 408, 514, 91-E9 (1993)
- RUMPH, TODD. The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupois, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine.* 410, L119, 126-D7 (1993)
- RYAN, J. M. Solar Neutron and Proton Production during the 1990 May 24 Cosmic-Ray Flare Increases. *H. Debrunner, J. A. Lockwood, & J. M. Ryan.* 409, 822, 109-D1 (1993)
- RYDEN, BARBARA S. The Shapes of Brightest Cluster Galaxies. *Barbara S. Ryden, Tod R. Lauer, & Marc Postman.* 410, 515, 120-B1 (1993)
- SAFIER, PEDRO N. Centrifugally Driven Winds from Protostellar Disks. I. Wind Model and Thermal Structure. *Pedro N. Safier.* 408, 115, 84-E6 (1993)
- Centrifugally Driven Winds from Protostellar Disks. II. Forbidden-Line Emission in T Tauri Stars. *Pedro N. Safier.* 408, 148, 85-A1 (1993)
- SAHA, PRASENJIT. Mapping Spherical Potentials with Discrete Radial Velocities. *David Merriut & Prasenjit Saha.* 409, 75, 97-G10 (1993)
- SAITO, SHUJI. Laboratory Measurements of the Millimeter-Wave Spectra of Calcium Isocyanide. *Timothy C. Sieimle, Shuji Saito, & Shuro Takano.* 410, L49, 118-C2 (1993)
- Laboratory Submillimeter-Wave Observation of the $N = 1-0$ Transition of the $\text{ND}(\tilde{2}^2\Sigma^-)$ Radical. *Shuji Saito & Masahiro Goto.* 410, L53, 118-C7 (1993)
- SALAMON, M. H. The High-Energy Diffuse Cosmic Gamma-Ray Background Radiation from Blazars. *F. W. Stecker, M. H. Salamon, & M. A. Malkan.* 410, L71, 125-F5 (1993)
- SALO, HEIKKI. The Interacting System NGC 7753-7752 (Arp 86). I. BVRI Photometry. *Eija Laurikainen, Heikki Salo, & Antonio Aparicio.* 410, 574, 120-G3 (1993)
- The Interacting System NGC 7753-7752 (Arp 86). II. N-Body Modeling. *Heikki Salo & Eija Laurikainen.* 410, 586, 121-A6 (1993)
- SALPETER, EDWIN E. Helium Destruction and Gamma-Ray Line Emission in Accreting Neutron Stars. *Lars Bildsten, Edwin E. Salpeter, & Ira Wasserman.* 408, 615, 92-G9 (1993)
- SALVADOR-SOLÉ, EDUARD. Small-Scale Substructure in Relaxed Clusters. I. Statistical Characterization. *Eduard Salvador-Solé, Guillermo González-Casado, & José María Solanes.* 410, 1, 112-B1 (1993)
- Small-Scale Substructure in Relaxed Clusters. II. Clustering Model. *Guillermo González-Casado, José María Solanes, & Eduard Salvador-Solé.* 410, 15, 112-C8 (1993)

- SAMBRUNA, R. M. A Spectral Study of Four X-Ray-selected BL Lacertae Objects with EXOSAT. *R. M. Sambruna, P. Barr, L. Maraschi, G. Tagliaferri, & A. Treves.* 408, 452, 90-G1 (1993)
- SANDERS, D. B. Imaging of Luminous Infrared Galaxies at 3.4 Microns. *Shudong Zhou, C. G. Wynn-Williams, & D. B. Sanders.* 409, 149, 98-G1 (1993)
- Molecular Gas in Powerful Radio Galaxies Detected by IRAS. *J. M. Mazzarella, J. R. Graham, D. B. Sanders, & S. Djorgovski.* 409, 170, 99-A13 (1993)
- SANDFORD, SCOTT A. H₂ in Interstellar and Extragalactic Ices: Infrared Characteristics, Ultraviolet Production, and Implications. *Scott A. Sandford & Louis J. Allamandola.* 409, L65, 111-F1 (1993)
- Spectral Imaging of the 3.3 and 11.3 Micron Emission Bands in NGC 1333: Discovery of Spatially Separate Band Emissions. *Jesse Bregman, David Rank, Scott A. Sandford, & Pasquale Temi.* 410, 668, 122-A5 (1993)
- SARGENT, A. I. Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. *D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith.* 408, L93, 95-D7 (1993)
- SARGENT, WALLACE L. W. HST Observations of NGC 4395, the Least Luminous Seyfert 1 Nucleus: Evidence against the Starburst Hypothesis for Broad-lined Active Galactic Nuclei. *Alexei V. Filippenko, Luis C. Ho, & Wallace L. W. Sargent.* 410, L75, 125-F11 (1993)
- SASLAW, WILLIAM C. Nonlinear Properties and Time Evolution of Gravitational Galaxy Clustering. *William C. Saslaw & Ravi K. Sheth.* 409, 504, 105-B13 (1993)
- SCHANZ, W. The s-Process between A = 120 and 124: Signature of Neutron Density and Temperature in Red Giants. *F. Käppler, W. Schanz, K. Wisshak, & G. Reffo.* 410, 370, 116-F3 (1993)
- SCHINDLER, STEPHEN M. An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7-2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 408, 507, 91-E7 (1993)
- SCHMELZ, J. T. Elemental Abundances of Flaring Solar Plasma: Enhanced Neon and Sulfur. *J. T. Schmelz.* 408, 373, 87-G5 (1993)
- SCHMIDT, EDWARD G. Far-Ultraviolet Stellar Photometry: A Field in Monoceros. *Edward G. Schmidt & George R. Carruthers.* 408, 484, 91-C1 (1993)
- SCHMIDT, GARY D. Optical and Hubble Space Telescope Ultraviolet Spectropolarimetry of 3C 273 and PG 1114+445. *Paul S. Smith, Gary D. Schmidt, & Richard G. Allen.* 409, 604, 106-D13 (1993)
- SCHMITT, J. H. M. M. Stellar Coronae at the End of the Main Sequence: A ROSAT Survey of the Late M Dwarfs. *Thomas A. Fleming, Mark S. Giampapa, J. H. M. M. Schmitt, & Jay A. Bookbinder.* 410, 387, 116-G8 (1993)
- SCHNEID, E. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- SCHNEID, E. J. See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- SCHNEIDER, D. P. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- SCHNEPP, NEIL. Diffuse Gamma-Ray Emission from Pulsars in the Large Magellanic Cloud. *Dieter H. Hartmann, Lawrence E. Brown, & Neil Schnepf.* 408, L13, 88-F8 (1993)
- SCHOMMER, R. A. The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer.* 409, 14, 97-C1 (1993)
- SCHRAMM, DAVID N. Kurtosis, Skewness, and Non-Gaussian Cosmological Density Perturbations. *Xiaochun Luo & David N. Schramm.* 408, 33, 83-E1 (1993)
- SCHWARZSCHILD, MARTIN. Self-consistent Models for Galactic Halos. *Martin Schwarzschild.* 409, 563, 106-A3 (1993)
- SCIAMA, D. W. Neutrino Decay and the Heat Budget of the Warm Interstellar Medium. *D. W. Sciama.* 409, L25, 104-D9 (1993)
- SCODEGGIO, MARCO. 21 Centimeter Study of Spiral Galaxies in Clusters. III. Neutral Gas Content, Star Formation, and Radio Continuum Properties. *Marco Scoddeggio & Giuseppe Gavazzi.* 409, 110, 98-C8 (1993)
- SCOVILLE, N. Z. Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. *M. Barsony, N. Z. Scoville, & C. J. Chandler.* 409, 275, 100-E4 (1993)
- SCOVILLE, NICHOLAS Z. Circumstellar Molecular Gas of the HH 34 and HH 111 Exciting Stars. *Karl R. Stapelfeldt & Nicholas Z. Scoville.* 408, 239, 86-B1 (1993)
- SEAQUIST, E. R. A Highly Sensitive Radio Survey of Symbiotic Stars at 3.6 Centimeters. *E. R. Seaquist, M. Krogulec, & A. R. Taylor.* 410, 260, 115-C12 (1993)
- SERABYN, E. H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith.* 408, L105, 95-F1 (1993)
- SERLEMITOS, P. J. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- SHAKHOVSKOY, N. M. Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Piroola.* 410, 342, 116-C10 (1993)
- SHANDARIN, SERGEI F. Controlled Experiments in Cosmological Gravitational Clustering. *Adrian L. Melott & Sergei F. Shandarin.* 410, 469, 119-E1 (1993)
- SHAPIRO, I. Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian.* 410, 21, 112-D1 (1993)
- SHAPIRO, PAUL R. Large-Scale Explosions and Superbubbles in the Galactic Disk and Halo. I. Magnetohydrodynamic Simulations. *Shin Mineshige, Kazunari Shibata, & Paul R. Shapiro.* 409, 663, 107-C1 (1993)
- SHAPOVALOVA, A. I. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- SHASTRI, P. Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell.* 410, 29, 112-D11 (1993)
- SHAYER, P. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- SHEMAR, S. L. A Young, Glitching Pulsar near the Direction of W28. *V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar.* 409, L57, 111-E1 (1993)
- SHETH, RAVI K. Nonlinear Properties and Time Evolution of Gravitational Galaxy Clustering. *William C. Saslaw & Ravi K. Sheth.* 409, 504, 105-B13 (1993)
- SHIBATA, KAZUNARI. Large-Scale Explosions and Superbubbles in the Galactic Disk and Halo. I. Magnetohydrodynamic Simulations. *Shin Mineshige, Kazunari Shibata, & Paul R. Shapiro.* 409, 663, 107-C1 (1993)
- SHIBAZAKI, NORIYAKI. Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibazaki, Ken'ichi Nomoto, & Sachiko Tsuruta.* 408, 186, 85-D7 (1993)
- SHIELDS, J. C. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- SHIELDS, JOSEPH C. The Ionizing Radiation of Seyfert 2 Galactic Nuclei. *Luis C. Ho, Joseph C. Shields, & Alexei V. Filippenko.* 410, 567, 120-F9 (1993)
- SHIELS, AARON. The Hyades Cluster-Supercluster Connection: Evidence for a Local Concentration of Dark Matter. *Stefano Casertano, Icko Iben, Jr., & Aaron Shiels.* 410, 90, 113-C5 (1993)
- SHLOSMA, ISAAC. Winds from Accretion Disks: Ultraviolet Line Formation in Cataclysmic Variables. *Isaac Shlosman & Peter Vitello.* 409, 372, 101-F1 (1993)
- Ultraviolet Line Diagnostics of Accretion Disk Winds in Cataclysmic Variables. *Peter Vitello & Isaac Shlosman.* 410, 815, 123-G11 (1993)

- SHORE, S. N. See MICHALITSIANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- SIEBENMORGEN, RALF. The Spectral Energy Distribution of Star-forming Regions. *Ralf Siebenmorgen*. 408, 218, 85-G3 (1993)
- SIEMIGINOWSKA, ANETA. Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Sitko, Annamaria K. Sitko, Aneta Siemiginowska, & R. Szczerba*. 409, 139, 98-F5 (1993)
- SILK, JOSEPH. Deep Galaxy Count Predictions in the Radio, Infrared, and X-Ray Spectral Bands. *Marie-Agnes Treyer & Joseph Silk*. 408, L1, 88-E1 (1993)
- SIME, D. G. Solar Coronal Structure near the Time of the 1991 July 11 Total Solar Eclipse. *D. G. Sime & J. Streete*. 408, 368, 87-F6 (1993)
- SIMON, M. Multiplicity and the Ages of the Stars in the Taurus Star-forming Region. *M. Simon, A. M. Ghez, & Ch. Leinert*. 408, L33, 89-B1 (1993)
- SIMON, NORMAN R. A Provisional RR Lyrae Distance Scale. *Norman R. Simon & Christine M. Clement*. 410, 526, 120-C1 (1993)
- SIMON, THEODORE. A Catalog of Stellar Lyman-Alpha Fluxes. *Wayne Landsman & Theodore Simon*. 408, 305, 87-A1 (1993)
- SIMONNEAU, E. An Implicit Integral Method to Solve Selected Radiative Transfer Problems. I. Non-LTE Line Formation. *E. Simonneau & L. Crivellari*. 409, 830, 109-D12 (1993)
- SITKO, ANNAMARIA K. Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Sitko, Annamaria K. Sitko, Aneta Siemiginowska, & R. Szczerba*. 409, 139, 98-F5 (1993)
- SITKO, MICHAEL L. Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Sitko, Annamaria K. Sitko, Aneta Siemiginowska, & R. Szczerba*. 409, 139, 98-F5 (1993)
- SKILLMAN, EVAN. New 325 MHz Observations of H II Galaxies: The Mechanisms That Shape the Unusual Radio Spectra. *Hans-Jörg Deeg, Elias Brinks, Neb Duric, Uli Klein, & Evan Skillman*. 410, 626, 121-D13 (1993)
- SKINNER, STEPHEN L. Circularly Polarized Radio Emission from the T Tauri Star Hubble 4. *Stephen L. Skinner*. 408, 660, 93-D6 (1993)
- SKRUTSKIE, M. F. Detection of Circumstellar Gas Associated with GG Tauri. *M. F. Skrutskie, R. L. Snell, K. M. Strom, S. E. Strom, S. Edwards, Y. Fukui, A. Mizuno, M. Hayashi, & N. Ohashi*. 409, 422, 102-C1 (1993)
- SLEZAK, E. Objective Detection of Voids and High-Density Structures in the First CfA Redshift Survey Slice. *E. Slezak, V. de Lapparent, & A. Bijaoui*. 409, 517, 105-D1 (1993)
- SLOAN, G. C. Spatially Resolved Spectra of the Unidentified Infrared Features around HD 44179 (The Red Rectangle). *G. C. Sloan, G. L. Grasdale, & Paul D. LeVan*. 409, 412, 102-B3 (1993)
- SMALE, A. P. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT. *A. P. Smale, C. Done, R. F. Mushotsky, K. A. Weaver, P. J. Serlemitsos, F. E. Marshall, R. Petre, K. M. Jahoda, E. A. Boldt, J. H. Swank, A. E. Szymkowiak, R. L. Kelley, & K. Arnaud*. 410, 796, 123-F1 (1993)
- SMALE, ALAN P. Optical and X-Ray Observations of the Low-Mass X-Ray Binary EXO 0748-676. *Brian Thomas, Robin Corbet, Thomas Augusteijn, Paul Callanan, & Alan P. Smale*. 408, 651, 93-C7 (1993)
- SMITH, C. H. An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitlock, & C. Wright*. 409, 404, 102-A8 (1993)
- SMITH, D. F. The Free Energies of Partially Open Coronal Magnetic Fields. *B. C. Low & D. F. Smith*. 410, 412, 117-B10 (1993)
- SMITH, H. A. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- SMITH, I. A. TeV Gamma Rays from Millisecond Pulsars and the Detectability of Globular Clusters. *I. A. Smith*. 408, 468, 91-A7 (1993)
- Relativistic Electron-Positron Beams in Gamma-Ray Bursters. *I. A. Smith & Richard I. Epstein*. 410, 315, 116-A6 (1993)
- Disk Plus Halo Models of Gamma-Ray Burst Sources. *I. A. Smith & D. Q. Lamb*. 410, L23, 118-A9 (1993)
- SMITH, MYRON A. Dynamic Processes in Be Star Atmospheres. I. "Dimple" Formation in the He sci $\lambda 6678$ Line of λ Eridani. *Myron A. Smith & Ronald S. Polidan*. 408, 323, 87-B8 (1993)
- A Giant X-Ray Flare on λ Eridani (B2e). *Myron A. Smith, Carol A. Grady, Geraldine J. Peters, & Eric D. Feigelson*. 409, L49, 111-D1 (1993)
- SMITH, P. L. High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmond, K. Ito, & M. H. Stevens*. 410, 837, 124-B8 (1993)
- SMITH, P. S. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- SMITH, PAUL S. Optical and Hubble Space Telescope Ultraviolet Spectropolarimetry of 3C 273 and PG 1114+445. *Paul S. Smith, Gary D. Schmidt, & Richard G. Allen*. 409, 604, 106-D13 (1993)
- SMITH, VERNE V. The $^6\text{Li}/^7\text{Li}$ Ratio in the Metal-poor Halo Dwarfs HD 19445 and HD 84937. *Verne V. Smith, David L. Lambert, & Poul E. Nissen*. 408, 262, 86-D1 (1993)
- SMOOT, G. See MEINHOLD, P., et al. Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5° Scale near the Star μ Pegasi.
- SMOOT, G. F. Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky*. 409, 1, 97-B1 (1993)
- SMYTH, WILLIAM H. The OH Distribution in Cometary Atmospheres: A Collisional Monte Carlo Model for Heavy Species. *Michael R. Combi, Brent J. Bos, & William H. Smyth*. 408, 668, 93-E1 (1993)
- SNELL, R. L. See SKRUTSKIE, M. F., et al. Detection of Circumstellar Gas Associated with GG Tauri.
- SNOWDEN, S. L. The X-Ray Shadow of the High-Latitude Molecular Cloud MBM 12. *S. L. Snowden, D. McCammon, & F. Verter*. 409, L21, 104-D1 (1993)
- SODERBLOM, DAVID R. The Evolution of Angular Momentum among Zero-Age Main-Sequence Solar-Type Stars. *David R. Soderblom, John R. Stauffer, Keith B. MacGregor, & Burton F. Jones*. 409, 624, 106-F13 (1993)
- SOIFER, B. T. H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith*. 408, L105, 95-F1 (1993)
- SOKER, NOAM. The Morphology and Interaction with the Interstellar Medium of the Planetary Nebula IC 4593. *Daniel B. Zucker & Noam Soker*. 408, 579, 92-D5 (1993)
- SOLANES, JOSÉ MARÍA. Small-Scale Substructure in Relaxed Clusters. I. Statistical Characterization. *Eduard Salvador-Solé, Guillermo González-Casado, & José María Solanes*. 410, 1, 112-B1 (1993)
- Small-Scale Substructure in Relaxed Clusters. II. Clustering Model. *Guillermo González-Casado, José María Solanes, & Eduard Salvador-Solé*. 410, 15, 112-C8 (1993)
- SOLF, J. High-Resolution Long-Slit Spectral Imaging of the Mass Outflows in the Immediate Vicinity of DG Tauri. *J. Solf & K. H. Böhm*. 410, L31, 118-F13 (1993)
- SOMMER, M. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- SONNEBORN, G. See MICHALITSIANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- SPICER, D. S. Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer*. 409, 465, 102-F9 (1993)
- SPINRAD, HYRON. An Optically Luminous Radio Galaxy at $z = 3.22$ and the K-z Diagram at High Redshift. *Stephen A. Eales, Steve*

- Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy. 409, 578, 106-B7 (1993)
- SPITZER, LYMAN, JR. Composition of Interstellar Clouds in the Disk and Halo. I. HD 93521. *Lyman Spitzer, Jr., & Edward L. Fitzpatrick.* 409, 299, 100-G3 (1993)
- SRAMEK, RICHARD A. The Radio Emission from the Type Ic Supernova SN 1990B. *Schuyler D. Van Dyk, Richard A. Sramek, Kurt W. Weiler, & Nino Panagia.* 409, 162, 99-A3 (1993)
- SREEKUMAR, P. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537-441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- SRIVASTAVA, KRISHNA M. Numerical Solution of Wave Equations for the Stability of the Inner Cometo-Sheath. *Krishna M. Srivastava, Bruce T. Tsurutani, & Bruce E. Goldstein.* 409, 782, 108-G7 (1993)
- STACEY, G. J. Extended CO(7-6) Emission from Warm Gas in Orion. *J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey.* 410, 179, 114-D1 (1993)
- STANGHELLINI, LETIZIA. Search for Ionized Cores in Proto-Planetary Nebulae, and the Asymptotic Giant Branch to Planetary Nebula Transition. *Hans Ulrich Käufl, Alvio Renzini, & Letizia Stanghellini.* 410, 251, 115-C1 (1993)
- STAPELFELDT, KARL R. Circumstellar Molecular Gas of the HH 34 and HH 111 Exciting Stars. *Karl R. Stapelfeldt & Nicholas Z. Scoville.* 408, 239, 86-B1 (1993)
- STARK, B. A. The Cutoff Frequency for Fast-Mode Magnetohydrodynamic Waves in an Isothermal Atmosphere with a Uniform Horizontal Magnetic Field. *B. A. Stark & Z. E. Musielak.* 409, 450, 102-E5 (1993)
- STARK, G. High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmond, K. Ito, & M. H. Stevens.* 410, 837, 124-B8 (1993)
- STARK, PHILIP B. Uncertainty of the Cosmic Background Explorer Quadrupole Detection. *Philip B. Stark.* 408, L73, 95-B1 (1993)
- STARRFIELD, S. G. See MICHALITSIANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- STAUFFER, JOHN R. The Evolution of Angular Momentum among Zero-Age Main-Sequence Solar-Type Stars. *David R. Soderblom, John R. Stauffer, Keith B. MacGregor, & Burton F. Jones.* 409, 624, 106-F13 (1993)
- STEBBINS, ROBIN T. Observation of Impulsive Acoustic Events and the Excitation of Solar Oscillations. *Sergio R. Restaino, Robin T. Stebbins, & Philip R. Goode.* 408, L57, 89-E9 (1993)
- STECKER, F. W. The High-Energy Diffuse Cosmic Gamma-Ray Background Radiation from Blazars. *F. W. Stecker, M. H. Salamon, & M. A. Malkan.* 410, L71, 125-F5 (1993)
- STEIMLE, TIMOTHY C. Laboratory Measurements of the Millimeter-Wave Spectra of Calcium Isocyanide. *Timothy C. Steimle, Shuji Saito, & Shuro Takano.* 410, L49, 118-C2 (1993)
- STEIN, ROBERT F. Ionization Effects in Three-dimensional Solar Granulation Simulations. *Mark P. Rast, Åke Nordlund, Robert F. Stein, & Juri Toomre.* 408, L53, 89-D11 (1993)
- STERN, C. Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, J. Shapiro, & A. C. Fabian.* 410, 21, 112-D1 (1993)
- STETSON, PETER B. Canada-France-Hawaii Telescope Observations of Globular Cluster Cores: Blue Straggler Stars in M3 (NGC 5272, GC 1339+286). *Michael Bolte, James E. Hesser, & Peter B. Stetson.* 408, L89, 95-C11 (1993)
- STEVENS, M. H. High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmond, K. Ito, & M. H. Stevens.* 410, 837, 124-B8 (1993)
- STEVENSON, CHRISTOPHER C. Ar/S. *Christopher C. Stevenson, Marshall L. McCall, & Douglas L. Welch.* 408, 460, 90-G11 (1993)
- ST-LOUIS, N. Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Pirola.* 410, 342, 116-C10 (1993)
- STOCKE, JOHN T. X-Ray Spectra of 12 Distant Clusters of Galaxies. *Qingde Wang & John T. Stocke.* 408, 71, 84-A4 (1993)
- STOMPOR, RADOŚŁAW. Cold Dark Matter and Degree-Scale Cosmic Microwave Background Anisotropy Statistics after COBE. *Krzysztof M. Górski, Radosław Stompór, & Roman Juszkiewicz.* 410, L1, 117-F1 (1993)
- STONE, EDWARD C. An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7-2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 408, 507, 91-E7 (1993)
- STORCHI-BERGMANN, THAISA. Double-peaked Broad Line Emission from the LINER Nucleus of NGC 1097. *Thaisa Storchi-Bergmann, Jack A. Baldwin, & Andrew S. Wilson.* 410, L11, 117-G1 (1993)
- STOTHERS, RICHARD B. Dynamical Instability as the Cause of the Massive Outbursts in η Carinae and Other Luminous Blue Variables. *Richard B. Stothers & Chao-wen Chin.* 408, L85, 95-C5 (1993)
- STRAUSS, MICHAEL A. The Cosmic Mach Number: Direct Comparisons of Observations and Models. *Michael A. Strauss, Renyue Cen, & Jeremiah P. Ostriker.* 408, 389, 90-B1 (1993)
- STREETE, J. Solar Coronal Structure near the Time of the 1991 July 11 Total Solar Eclipse. *D. G. Sime & J. Streete.* 408, 368, 87-F6 (1993)
- STROM, K. M. See SKRUTSKIE, M. F., et al. Detection of Circumstellar Gas Associated with GG Tauri.
- STROM, S. E. See SKRUTSKIE, M. F., et al. Detection of Circumstellar Gas Associated with GG Tauri.
- STURROCK, P. A. Evidence for a Fundamental Period of the Sun and Its Relation to the 154 Day Complex of Periodicities. *T. Bai & P. A. Sturrock.* 409, 476, 102-G8 (1993)
- SU, J. J. Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer.* 409, 465, 102-F9 (1993)
- SUBRAMANIAN, K. Zel'dovich Approximation and the Probability Distribution for the Smoothed Density Field in the Nonlinear Regime. *T. Padmanabhan & K. Subramanian.* 410, 482, 119-F1 (1993)
- SULENTIC, J. W. The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston.* 410, 56, 112-G4 (1993)
- SULENTIC, JACK W. Evidence for a Very Broad Line Region in PG 1138+222. *Paolo Marziani & Jack W. Sulentic.* 409, 612, 106-E10 (1993)
- Searching for a Far-Infrared Enhancement in Compact Groups of Galaxies. *Jack W. Sulentic & Duilia F. De Mello Rabaça.* 410, 520, 120-B8 (1993)
- SUN, W.-H. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- SUTO, YASUSHI. Clusters and Groups of Galaxies as Cosmological Probes. *Haruhiko Ueda, Makoto Itoh, & Yasushi Suto.* 408, 3, 83-B5 (1993)
- SWANK, J. H. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- SZALAY, ALEXANDER S. Higher Order Statistics of the Galaxy Distribution Using Generating Functions. *István Szapudi & Alexander S. Szalay.* 408, 43, 83-E13 (1993)
- SZAPUDI, ISTVÁN. Higher Order Statistics of the Galaxy Distribution Using Generating Functions. *István Szapudi & Alexander S. Szalay.* 408, 43, 83-E13 (1993)
- SZCZERBA, R. Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Sisko, Annamaria K. Sisko, Aneta Siemiginowska, & R. Szczerba.* 409, 139, 98-F5 (1993)
- SZYMKOWIAK, A. E. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.

- TAGLIAFERRI, G. A Spectral Study of Four X-Ray-selected BL Lacertae Objects with EXOSAT. *R. M. Sambruna, P. Barr, L. Maraschi, G. Tagliaferri, & A. Treves.* 408, 452, 90-G1 (1993)
- TAKANO, SHURO. Laboratory Measurements of the Millimeter-Wave Spectra of Calcium Isocyanide. *Timothy C. Steimle, Shuji Saito, & Shuro Takano.* 410, L49, 118-C2 (1993)
- TAKESHIMA, T. The Discovery of Pulsed Iron Line Emission from Centaurus X-3. *C. S. R. Day, F. Nagase, K. Asai, & T. Takeshima.* 408, 656, 93-D1 (1993)
- TALBI, D. Theoretical Infrared Spectra of Some Model Polycyclic Aromatic Hydrocarbons: Effect of Ionization. *D. J. De Frees, M. D. Miller, D. Talbi, F. Pauzat, & Y. Ellinger.* 408, 530, 91-G5 (1993)
- TAN, L. C. Magnetic Field Power Density Spectra during "Scatter-free" Solar Particle Events. *L. C. Tan & G. M. Mason.* 409, L29, 104-E1 (1993)
- TANAKA, M. See BOCK, J., et al. Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude.
- TANIGUCHI, YOSHIKI. Near-Infrared Spectroscopy of the Peculiar Giant Elliptical NGC 1275. *Kimiaki Kawara & Yoshiaki Taniguchi.* 410, L19, 117-G13 (1993)
- TAPIA, M. Further Studies on the Champagne Phase of GM 24 (IRAS 17136–3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho.* 409, 269, 100-D10 (1993)
- TAVANI, MARCO. Hydrodynamics of Winds from Irradiated Companion Stars in Low-Mass X-Ray Binaries. *Marco Tavani & Richard London.* 410, 281, 115-E8 (1993)
- Wind-driven Angular Momentum Loss in Binary Systems. I. Ballistic Case. *Leigh Brookshaw & Marco Tavani.* 410, 719, 122-F6 (1993)
- TAYLOR, A. R. A Highly Sensitive Radio Survey of Symbiotic Stars at 3.6 Centimeters. *E. R. Seaquist, M. Krogulec, & A. R. Taylor.* 410, 260, 115-C12 (1993)
- TAYLOR, GREGORY B. Radio and X-Ray Observations of OH 231.8+4.2. *Gregory B. Taylor & Mark Morris.* 409, 720, 108-A9 (1993)
- TAYLOR, J. H. See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- TEMI, PASQUALE. Spectral Imaging of the 3.3 and 11.3 Micron Emission Bands in NGC 1333: Discovery of Spatially Separate Band Emissions. *Jesse Bregman, David Rank, Scott A. Sandford, & Pasquale Temi.* 410, 668, 122-A5 (1993)
- THIELE, U. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- THIELHEIM, K. O. Particle Dynamics in Spherical Wave Fields of Rotating Magnets: Acceleration Boundary, Plasma Border, and $1/2$ Law of Asymptotic Energy. *K. O. Thielheim.* 409, 333, 101-C1 (1993)
- THOMAS, BRIAN. Optical and X-Ray Observations of the Low-Mass X-Ray Binary EXO 0748–676. *Brian Thomas, Robin Corbet, Thomas Augsteijn, Paul Callanan, & Alan P. Smale.* 408, 651, 93-C7 (1993)
- THOMASSON, MAGNUS. Models for the Magnetic Field of M81. *David Moss, Axel Brandenburg, Karl Johan Donner, & Magnus Thomasson.* 409, 179, 99-B10 (1993)
- THOMPSON, CHRISTOPHER. Neutron Star Dynamos and the Origins of Pulsar Magnetism. *Christopher Thompson & Robert C. Duncan.* 408, 194, 85-E4 (1993)
- THOMPSON, D. J. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- Gamma Radiation from Blazar PKS 0537–441. *D. J. Thompson, D. L. Bertsch, C. E. Fichtel, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, P. L. Nolan, K. Pinkau, E. J. Schneid, & P. Sreekumar.* 410, 87, 113-C1 (1993)
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- THRONSON, HARLEY A., JR. The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- TONRY, JOHN L. Infrared Surface Brightness Fluctuations: K' -Band Observations of M31, M32, and the Distance to Maffei 1. *Gerard A. Luppino & John L. Tonry.* 410, 81, 113-B3 (1993)
- TOOMRE, JURI. Ionization Effects in Three-dimensional Solar Granulation Simulations. *Mark P. Rast, Åke Nordlund, Robert F. Stein, & Juri Toomre.* 408, L53, 89-D11 (1993)
- TORRELLES, J. M. Further Studies on the Champagne Phase of GM 24 (IRAS 17136–3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho.* 409, 269, 100-D10 (1993)
- TORRELLES, JOSÉ M. A Flattened Cloud Core in NGC 2024. *Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó.* 408, 565, 92-C1 (1993)
- From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. *José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó.* 410, 202, 114-F1 (1993)
- TREVES, A. A Spectral Study of Four X-Ray-selected BL Lacertae Objects with EXOSAT. *R. M. Sambruna, P. Barr, L. Maraschi, G. Tagliaferri, & A. Treves.* 408, 452, 90-G1 (1993)
- TREYER, MARIE-AGNES. Deep Galaxy Count Predictions in the Radio, Infrared, and X-Ray Spectral Bands. *Marie-Agnes Treyer & Joseph Silk.* 408, L1, 88-E1 (1993)
- TRUMPER, JOACHIM. ROSAT Observations of the Large Magellanic Cloud Pulsar PSR 0540–69. *John P. Finley, Hakki Ogelman, Günther Hasinger, & Joachim Trümper.* 410, 323, 116-B1 (1993)
- TSURU, T. X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai.* 409, 155, 98-G9 (1993)
- TSURUTA, SACHIKO. Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibasaki, Ken'ichi Nomoto, & Sachiko Tsuruta.* 408, 186, 85-D7 (1993)
- TSURUTANI, BRUCE T. Numerical Solution of Wave Equations for the Stability of the Inner Cometo-Sheath. *Krishna M. Srivastava, Bruce T. Tsurutani, & Bruce E. Goldstein.* 409, 782, 108-G7 (1993)
- TURCK-CHIEZE, SYLVAIN. Toward a Unified Classical Model of the Sun: On the Sensitivity of Neutrinos and Helioseismology to the Microscopic Physics. *Sylvaine Turck-Chièze & Ilidio Lopes.* 408, 347, 87-D10 (1993)
- TURNER, B. E. The Nature of the Molecular Cores in High-Latitude Cirrus Clouds. IV. The Electron Distribution and the Abundance and Chemistry of H_2CO . *B. E. Turner.* 410, 140, 113-G8 (1993)
- UEDA, HARUHIKO. Clusters and Groups of Galaxies as Cosmological Probes. *Haruhiko Ueda, Makoto Itoh, & Yasushi Suto.* 408, 3, 83-B5 (1993)
- UMEDA, HIDEYUKI. Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibasaki, Ken'ichi Nomoto, & Sachiko Tsuruta.* 408, 186, 85-D7 (1993)
- UNDERHILL, ANNE B. Plaskett's Star (HD 47129): More and More Curious. *Anne B. Underhill.* 410, 365, 116-E11 (1993)
- URRY, C. MEGAN. The Galactic Halo and Local Intergalactic Medium toward PKS 2155–304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo.* 409, 199, 99-D6 (1993)
- USOV, V. V. High-Frequency Emission of X-Ray Pulsar 1E 2259+586. *V. V. Usov.* 410, 761, 123-C1 (1993)
- VALLURI, MONICA. Compressive Tidal Heating of a Disk Galaxy in a Rich Cluster. *Monica Valluri.* 408, 57, 83-G1 (1993)
- VAN DER WALT, D. J. On the Separation of the Flaring Component's Emission in Variable Compact Extragalactic Radio Sources: Results from a Simple Shocked Relativistic Jet Model. *D. J. van der Walt.* 409, 126, 98-E3 (1993)
- VAN DYK, SCHUYLER D. The Radio Emission from the Type Ic Supernova SN 1990B. *Schuyler D. Van Dyk, Richard A. Sramek, Kurt W. Weiler, & Nino Panagia.* 409, 162, 99-A3 (1993)

- VAN PUTTEN, MAURICE H. P. M. A Two-dimensional Relativistic ($\Gamma = 3.25$) Jet Simulation. *Maurice H. P. M. van Putten*. 408, L21, 88-G8 (1993)
- VAROSI, F. High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman*. 409, L5, 104-B1 (1993)
- VEILLEUX, S. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- VENNES, STÉPHANE. The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupois, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine*. 410, L119, 126-D7 (1993)
- VENTURI, T. VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle*. 408, 81, 84-B4 (1993)
- VLBI Observations of a Complete Sample of Radio Galaxies. III. The Two-sided Milliarcsecond Structure of 3C 338. *L. Feretti, G. Comoretto, G. Giovannini, T. Venturi, & A. E. Wehrle*. 408, 446, 90-F7 (1993)
- VERDES-MONTENEGRO, LOURDES. From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. *José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó*. 410, 202, 114-F1 (1993)
- VERSCUUR, GERRIT L. A Supershell Model for the High- and Intermediate-Velocity Neutral Hydrogen Clouds. *Gerrit L. Verschuur*. 409, 205, 99-D13 (1993)
- VERTER, F. The X-Ray Shadow of the High-Latitude Molecular Cloud MBM 12. *S. L. Snowden, D. McCammon, & F. Verner*. 409, L21, 104-D1 (1993)
- VESTRAND, W. THOMAS. Evidence for a Spatially Extended Component of Gamma Rays from Solar Flares. *W. Thomas Vestrand & David J. Forrest*. 409, L69, 111-F8 (1993)
- VITELLO, PETER. Winds from Accretion Disks: Ultraviolet Line Formation in Cataclysmic Variables. *Isaac Shlosman & Peter Vitello*. 409, 372, 101-F1 (1993)
- Ultraviolet Line Diagnostics of Accretion Disk Winds in Cataclysmic Variables. *Peter Vitello & Isaac Shlosman*. 410, 815, 123-G11 (1993)
- VITTORIO, NICOLA. Tilted Cold Dark Matter Models Confront the Cosmic Microwave Background and the Galaxy Peculiar Velocity Field. *Pio Francesco Muciaccia, Simona Mei, Giancarlo de Gasperis, & Nicola Vittorio*. 410, L61, 125-E7 (1993)
- VON GOELER, S. High-Resolution Measurements, Line Identification, and Spectral Modeling of $K\alpha$ Transitions in Fe XVIII–Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn*. 409, 846, 109-F6 (1993)
- VON MONTIGNY, C. See HUNTER, S. D., et al. Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory.
- See NOLAN, P. L., et al. Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory.
- See THOMPSON, D. J., et al. Gamma Radiation from Blazar PKS 0537–441.
- See MATTOX, J. R., et al. The EGRET Detection of Quasar 1633+382.
- VORONTSOV, S. V. Asymptotic Theory of Intermediate- and High-Degree Solar Acoustic Oscillations. *M. Brodsky & S. V. Vorontsov*. 409, 455, 102-E11 (1993)
- WADE, R. Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Matthews, R. Wade, & W. D. Duncan*. 410, 650, 121-F11 (1993)
- WADE, RICHARD A. On the Mass of Nova DQ Herculis (1934). *Keith Horne, William F. Welsh, & Richard A. Wade*. 410, 357, 116-E1 (1993)
- WAGNER, R. M. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- WALKER, H. J. An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright*. 409, 404, 102-A8 (1993)
- WALL, W. F. Extended CO(7→6) Emission from Warm Gas in Orion. *J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey*. 410, 179, 114-D1 (1993)
- WAMPLER, E. JOSEPH. Star Trapping and Metallicity Enrichment in Quasars and Active Galactic Nuclei. *Paweł Artymowicz, D. N. C. Lin, & E. Joseph Wampler*. 409, 592, 106-C12 (1993)
- WANG, Q. DANIEL. On the Origin of the Soft X-Ray Background. *Q. Daniel Wang & Richard McCray*. 409, L37, 111-B8 (1993)
- WANG, QINGDE. X-Ray Spectra of 12 Distant Clusters of Galaxies. *Qingde Wang & John T. Stocke*. 408, 71, 84-A4 (1993)
- WANG, Y.-M. Flux-Tube Divergence, Coronal Heating, and the Solar Wind. *Y.-M. Wang*. 410, L123, 126-D13 (1993)
- WARDLE, J. F. C. Is 1308+326 a BL Lacertae Object or a Quasar? *D. C. Gabuzda, R. I. Kollgaard, D. H. Roberts, & J. F. C. Wardle*. 410, 39, 112-E12 (1993)
- WARDLE, MARK. The Structure of Protostellar Accretion Disks and the Origin of Bipolar Flows. *Mark Wardle & Arieh Königl*. 410, 218, 114-G6 (1993)
- WARREN, G. A. Fe III Emission Lines in the Optical Spectrum of the Planetary Nebula IC 4997. *F. P. Keenan, L. H. Aller, S. Hyung, E. S. Conlon, & G. A. Warren*. 410, 430, 117-D3 (1993)
- WASSERMAN, IRA. Helium Destruction and Gamma-Ray Line Emission in Accreting Neutron Stars. *Lars Bildsten, Edwin E. Salpeter, & Ira Wasserman*. 408, 615, 92-G9 (1993)
- WATERS, L. B. F. M. Dynamics of the Envelopes of Be Stars and Shell Stars in the Equatorial Plane: A Potential Similarity and Difference Based upon the Continuous Energy Distribution. *J. M. Marlborough, Haiqi Chen, & L. B. F. M. Waters*. 408, 646, 93-C1 (1993)
- WDOWIAK, THOMAS J. Laboratory Spectra of Polycyclic Aromatic Hydrocarbon Ions and the Interstellar Extinction Curve. *Wei Lee & Thomas J. Wdowiak*. 410, L127, 126-E5 (1993)
- WEAVER, K. A. See SMALE, A. P., et al. Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT.
- WEBB, J. R. See MICHALITSIANOS, A. G., et al. Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560.
- WEHRLE, A. E. VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle*. 408, 81, 84-B4 (1993)
- VLBI Observations of a Complete Sample of Radio Galaxies. III. The Two-sided Milliarcsecond Structure of 3C 338. *L. Feretti, G. Comoretto, G. Giovannini, T. Venturi, & A. E. Wehrle*. 408, 446, 90-F7 (1993)
- WEILER, KURT W. The Radio Emission from the Type Ic Supernova SN 1990B. *Schuyler D. Van Dyk, Richard A. Sramek, Kurt W. Weiler, & Nino Panagia*. 409, 162, 99-A3 (1993)
- WEINBERG, MARTIN D. Nonlocal and Collective Relaxation in Stellar Systems. *Martin D. Weinberg*. 410, 543, 120-D8 (1993)
- WEIR, N. See BENDINELLI, O., et al. The First Detection of a Collapsed Core Globular Cluster in M31.
- WEIS, BERNHARD. An Ab Initio Prediction of the Spectroscopic Constants of MgNC: The First Mg-bearing Molecule in Space. *Keisaku Ishii, Tsuneo Hirano, Umpei Nagashima, Bernhard Weis, & Koichi Yamashita*. 410, L43, 118-D7 (1993)
- WELCH, DOUGLAS L. At/S. Christopher C. Stevenson, Marshall L. McCall, & Douglas L. Welch. 408, 460, 90-G11 (1993)
- WELSH, WILLIAM F. On the Mass of Nova DQ Herculis (1934). *Keith Horne, William F. Welsh, & Richard A. Wade*. 410, 357, 116-E1 (1993)
- On the Location of the Oscillations in AE Aquarii. *William F. Welsh, Keith Horne, & Richard Gomer*. 410, L39, 118-D1 (1993)
- WEN, ZHENG. Motion in the Orion Nebula: A Kinematic Study of [S III]. *Zheng Wen & C. R. O'Dell*. 409, 262, 100-D1 (1993)
- Discovery of New Objects in the Orion Nebula on HST Images: Shocks, Compact Sources, and Protoplanetary Disks. *C. R. O'Dell, Zheng Wen, & Xihai Hu*. 410, 696, 122-C11 (1993)

- WHITE, RICHARD E. Interstellar Matter near the Pleiades. IV. The Wake of the Pleiades through the Interstellar Medium in Taurus. *Richard E. White & John Bally*. 409, 234, 99-G13 (1993)
- WHITELOCK, P. A. An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright*. 409, 404, 102-A8 (1993)
- WHITTET, D. C. B. Interstellar Extinction in the Infrared: The Molecular Cloud toward HD 62542. *D. C. B. Whittet, P. G. Martin, E. L. Fitzpatrick, & D. Massa*. 408, 573, 92-C11 (1993)
- An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright*. 409, 404, 102-A8 (1993)
- WIECHEN, HEINZ. Globally Stable Equilibria of Collisionless Self-gravitating Matter with Nonvanishing Total Angular Momentum. *Heinz Wiechen & Harald J. Ziegler*. 408, 293, 86-F13 (1993)
- WIEDEMANN, G. R. High-Resolution Mid-Infrared Spectra of Co II, Ni I, and Fe II in SN 1987A. *D. E. Jennings, R. J. Boyle, G. R. Wiedemann, & S. H. Moseley*. 408, 277, 86-E5 (1993)
- WILKES, B. J. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell*. 410, 29, 112-D11 (1993)
- WILLES, A. J. Dynamics of Langmuir and Ion-Sound Waves in Type III Solar Radio Sources. *P. A. Robinson, A. J. Willes, & I. H. Cairns*. 408, 720, 94-B9 (1993)
- WILLS, B. J. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- WILLS, BEVERLEY J. The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne*. 410, 534, 120-C11 (1993)
- WILLS, D. See DIETRICH, M., et al. Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548.
- The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne*. 410, 534, 120-C11 (1993)
- WILSON, A. S. High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman*. 409, L5, 104-B1 (1993)
- WILSON, ANDREW S. Double-peaked Broad Line Emission from the LINER Nucleus of NGC 1097. *Thaisa Storchi-Bergmann, Jack A. Baldwin, & Andrew S. Wilson*. 410, L11, 117-G1 (1993)
- WILSON, ROBERT W. Hierarchical Structure Analysis of Interstellar Clouds Using Nonorthogonal Wavelets. *William D. Langer, Robert W. Wilson, & Charles H. Anderson*. 408, L45, 89-C7 (1993)
- WINGE, CLAUDIA. A New Luminous Blue Variable: R143 in 30 Doradus. *Joel Wm. Parker, Geoffrey C. Clayton, Cláudia Winge, & Peter S. Conti*. 409, 770, 108-F3 (1993)
- WISSHAK, K. The s -Process between $A = 120$ and 124 : Signature of Neutron Density and Temperature in Red Giants. *F. Käppeler, W. Schanz, K. Wisshak, & G. Reffo*. 410, 370, 116-F3 (1993)
- WITEBSKY, C. Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky*. 409, 1, 97-B1 (1993)
- WITT, A. N. *Voyager 2* Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murphy, A. Dring, & R. C. Henry*. 410, 714, 122-E13 (1993)
- WITT, HANS J. The Velocity Dispersion of the Caustic Network Due to Random Motion of Individual Stars in the Lensing Galaxy. *Tomislav Kundić, Hans J. Witt, & Kyongae Chang*. 409, 537, 105-E13 (1993)
- WOLSZCZAN, A. A New Binary Millisecond Pulsar. *R. S. Foster, A. Wolszczan, & F. Camilo*. 410, L91, 126-A7 (1993)
- The Binary Pulsar PSR 1908+00 in NGC 6760. *W. T. S. Deich, J. Middleton, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan*. 410, L95, 126-A13 (1993)
- WOODWARD, CHARLES E. The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- WOOTEN, ALWYN. The Physical Structure of Orion-KL on 2500 AU Scales Using the K -Doublet Transitions of Formaldehyde. *Jeffrey G. Mangum, Alwyn Wooten, & Richard L. Plambeck*. 409, 282, 100-E13 (1993)
- WORTHY, GUY. The Dependence of the Brightness Fluctuation Distance Indicator on Stellar Population Age and Metallicity. *Guy Worthy*. 409, 530, 105-E3 (1993)
- WRIGHT, C. An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright*. 409, 404, 102-A8 (1993)
- WRIGHT, EDWARD L. The Interstellar $^7\text{Li}/^6\text{Li}$ Isotope Ratio toward ζ Ophiuchi and ζ Persei. *David M. Meyer, Isabel Hawkins, & Edward L. Wright*. 409, L61, 111-E8 (1993)
- WU, XIANG-PING. Anisotropy of Cosmic Background Radiation from a Spherical Clustering on Large Scales. *Li-Zhi Fang & Xiang-Ping Wu*. 408, 25, 83-D3 (1993)
- WYNN-WILLIAMS, C. G. Imaging of Luminous Infrared Galaxies at 3.4 Microns. *Shudong Zhou, C. G. Wynn-Williams, & D. B. Sanders*. 409, 149, 98-G1 (1993)
- XYSTUS, D. A. The Age of the Large Magellanic Cloud Cluster NGC 2031. *J. R. Mould, D. A. Xystus, & G. S. Da Costa*. 408, 108, 84-D8 (1993)
- YAMASHITA, KOICHI. An Ab Initio Prediction of the Spectroscopic Constants of MgNC: The First Mg-bearing Molecule in Space. *Keisaku Ishii, Tsuneo Hirano, Umpei Nagashima, Bernhard Weis, & Koichi Yamashita*. 410, L43, 118-D7 (1993)
- YANNY, B. See MAOZ, D., et al. The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars.
- YOSHINO, K. High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmond, K. Ito, & M. H. Stevens*. 410, 837, 124-B8 (1993)
- YOUNG, ERICK T. Infrared Images of the Young Cluster NGC 2264. *Charles J. Lada, Erick T. Young, & Thomas P. Greene*. 408, 471, 91-A11 (1993)
- YOUNG, K. Circumstellar Shells Resolved in *IRAS* Survey Data. II. Analysis. *K. Young, T. G. Phillips, & G. R. Knapp*. 409, 725, 108-B3 (1993)
- YOUNG, TIMOTHY R. On the Stellar Progenitor of the Type Ib Supernova 1984L. *E. Baron, Timothy R. Young, & David Branch*. 409, 417, 102-B10 (1993)
- YUN, JOÃO LIN. Near-Infrared Discovery of the L810 Nebula Illuminator. *João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke*. 408, L101, 95-E9 (1993)
- YUSEF-ZADEH, FARHAD. Highly Blueshifted H I Gas toward the Galactic Center. *Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall*. 410, L27, 118-G12 (1993)
- ZAVATTI, F. See BENDINELLI, O., et al. The First Detection of a Collapsed Core Globular Cluster in M31.
- ZDZIARSKI, ANDRZEJ A. Compton Scattering and the Gamma-Ray Power-Law Spectrum in Markarian 421. *Andrzej A. Zdziarski & Julian H. Krolik*. 409, L33, 111-B1 (1993)
- ZHANG, C. Y. On the Distance to Galactic Planetary Nebulae. *C. Y. Zhang*. 410, 239, 115-B1 (1993)
- ZHANG, HONG LIN. New Excitation Rates and Line Ratios for [Fe II]. *Anil K. Pradhan & Hong Lin Zhang*. 409, L77, 111-G8 (1993)
- ZHOU, SHUDONG. Imaging of Luminous Infrared Galaxies at 3.4 Microns. *Shudong Zhou, C. G. Wynn-Williams, & D. B. Sanders*. 409, 149, 98-G1 (1993)
- ZIEGLER, HARALD J. Globally Stable Equilibria of Collisionless Self-gravitating Matter with Nonvanishing Total Angular Momentum. *Heinz Wiechen & Harald J. Ziegler*. 408, 293, 86-F13 (1993)

- ZIURYS, L. M. The Millimeter-Wave Spectrum of CaH ($X^2\Sigma^+$). *W. L. Barclay, Jr., M. A. Anderson, & L. M. Ziurys*. 408, L65, 89-F8 (1993)
- ZUCKER, DANIEL B. The Morphology and Interaction with the Interstellar Medium of the Planetary Nebula IC 4593. *Daniel B. Zucker & Noam Soker*. 408, 579, 92-D5 (1993)
- ZUREK, WOJCIECH H. Tidal Disruptions by Supermassive Black Holes: Hydrodynamic Evolution of Stars on a Schwarzschild Background. *Pablo Laguna, Warner A. Miller, Wojciech H. Zurek, & Melvyn B. Davies*. 410, L83, 125-G9 (1993)

SUBJECT INDEX

PARTS 1 & 2, VOLUMES 408-410

1993 MAY 1 TO JUNE 20

ACCELERATION OF PARTICLES

- Spatial Spectral Index Variations in Galactic Shell Supernova Remnants G39.2-0.3 and G41.1-0.3. *Martha C. Anderson & Lawrence Rudnick*. 408, 514, 91-E9 (1993)
- The Injection and Acceleration of Particles in Oblique Shocks: A Unified Monte Carlo Description. *Matthew G. Baring, Donald C. Ellison, & Frank C. Jones*. 409, 327, 101-B8 (1993)
- Particle Dynamics in Spherical Wave Fields of Rotating Magnets: Acceleration Boundary, Plasma Border, and $1/r_0^2$ Law of Asymptotic Energy. *K. O. Thielheim*. 409, 333, 101-C1 (1993)
- Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. I. Su, J. M. Dawson, & D. S. Spicer*. 409, 465, 102-F9 (1993)
- Magnetic Field Power Density Spectra during "Scatter-free" Solar Particle Events. *L. C. Tan & G. M. Mason*. 409, L29, 104-E1 (1993)
- Relativistic Electron-Positron Beams in Gamma-Ray Bursters. *I. A. Smith & Richard I. Epstein*. 410, 315, 116-A6 (1993)
- High-Frequency Emission of X-Ray Pulsar 1E 2259+586. *V. V. Usov*. 410, 761, 123-C1 (1993)

ACCRETION, ACCRETION DISKS

- Origin and Radio Pulse Properties of Millisecond Pulsars. *Kaiyou Chen & Malvin Ruderman*. 408, 179, 85-C12 (1993)
- Encounters with Protostellar Disks. I. Disk Tilt and the Nonzero Solar Obliquity. *Clayton H. Heller*. 408, 337, 87-C11 (1993)
- The Secondary Maxima in Black Hole X-Ray Nova Light Curves: Clues toward a Complete Picture. *Wan Chen, Mario Livio, & Neil Gehrels*. 408, L5, 88-E8 (1993)
- Helium Destruction and Gamma-Ray Line Emission in Accreting Neutron Stars. *Lars Bildsten, Edwin E. Salpeter, & Ira Wasserman*. 408, 615, 92-G9 (1993)
- Wave Propagation in Accretion Disks: Axisymmetric Case. *S. H. Lubow & J. E. Pringle*. 409, 360, 101-E3 (1993)
- Winds from Accretion Disks: Ultraviolet Line Formation in Cataclysmic Variables. *Isaac Shlosman & Peter Vitello*. 409, 372, 101-F1 (1993)
- A Search for Rapid Variability in the Broad H α Profiles of Seyfert and Radio Galaxies. *Michael Eracleous & Jules P. Halpern*. 409, 584, 106-C1 (1993)
- Two-dimensional Viscous Accretion Disk Models. II. On Viscous Overstability. *W. Kley, J. C. B. Papaloizou, & D. N. C. Lin*. 409, 739, 108-C6 (1993)
- The Origin of Forbidden Line Emission from Young Stellar Objects. *Ana I. Gomez de Castro & Ralph E. Pudritz*. 409, 748, 108-D3 (1993)
- Features of the Fluorescent Iron Line from Highly Inclined Disks: Some Possible Examples for NGC 6814. *G. Bao*. 409, L41, 111-C1 (1993)
- The Structure of Protostellar Accretion Disks and the Origin of Bipolar Flows. *Mark Wardle & Ariele Königl*. 410, 218, 114-G6 (1993)
- A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung*. 410, 309, 115-G12 (1993)
- Wind-driven Angular Momentum Loss in Binary Systems. I. Ballistic Case. *Leigh Brookshaw & Marco Tavan*. 410, 719, 122-F6 (1993)
- Ultraviolet Line Diagnostics of Accretion Disk Winds in Cataclysmic Variables. *Peter Vitello & Isaac Shlosman*. 410, 815, 123-G11 (1993)
- The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. *V. Pirola, P. Hakala, & G. V. Coyne*. S.J. 410, L107, 126-C3 (1993)

ASTROMETRY

- High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman*. 409, L5, 104-B1 (1993)

ATOMIC DATA

- Radiative Lifetimes, Branching Ratios, and Absolute Transition Probabilities in Cr II and Zn II. *S. D. Bergeson & J. E. Lawler*. 408, 382, 88-A3 (1993)
- Effective Collision Strengths for O II. *Brendan M. McLaughlin & Kenneth L. Bell*. 408, 753, 94-E3 (1993)
- Semiclassical Approximation for Electron Impact Excitation of Hydrogenic Ions. *Young-Dae Jung*. 409, 841, 109-E12 (1993)
- High-Resolution Measurements, Line Identification, and Spectral Modeling of K α Transitions in Fe XVIII-Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn*. 409, 846, 109-F6 (1993)
- New Excitation Rates and Line Ratios for [Fe II]. *Anil K. Pradhan & Hong Lin Zhang*. 409, L77, 111-G8 (1993)
- Fe III Emission Lines in the Optical Spectrum of the Planetary Nebula IC 4997. *F. P. Keenan, L. H. Aller, S. Hyung, E. S. Conlon, & G. A. Warren*. 410, 430, 117-D3 (1993)

ATOMIC PROCESSES

- The Optically Thin C III Spectrum: Line and Multiplet Intensities. *A. K. Bhatia & S. O. Kastner*. 408, 744, 94-D7 (1993)
- Semiclassical Approximation for Electron Impact Excitation of Hydrogenic Ions. *Young-Dae Jung*. 409, 841, 109-E12 (1993)
- High-Resolution Measurements, Line Identification, and Spectral Modeling of K α Transitions in Fe XVIII-Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn*. 409, 846, 109-F6 (1993)
- The Ratio of Optical-to-Infrared Emission Line Strengths in Ar III as Electron Density Diagnostics for Planetary Nebulae. *F. P. Keenan & E. S. Conlon*. 410, 426, 117-C12 (1993)

BLACK HOLE PHYSICS

- The Secondary Maxima in Black Hole X-Ray Nova Light Curves: Clues toward a Complete Picture. *Wan Chen, Mario Livio, & Neil Gehrels*. 408, L5, 88-E8 (1993)
- Massive Star Formation near the Galactic Center and the Fate of the Stellar Remnants. *Mark Morris*. 408, 496, 91-D1 (1993)
- VLA Observations of 1E 1740.7-2942: A Search for Radio Recombination Lines of Positronium. *K. R. Anantharamaiah, K. S. Dwarakanath, D. Morris, W. M. Goss, & V. Radhakrishnan*. 410, 110, 113-E1 (1993)
- Tidal Disruptions by Supermassive Black Holes: Hydrodynamic Evolution of Stars on a Schwarzschild Background. *Pablo Laguna, Warner A. Miller, Wojciech H. Zurek, & Melvyn B. Davies*. 410, L83, 125-G9 (1993)

CATALOGS

- A Catalog of Stellar Lyman-Alpha Fluxes. *Wayne Landsman & Theodore Simon*. 408, 305, 87-A1 (1993)

CELESTIAL MECHANICS, STELLAR DYNAMICS

- Globally Stable Equilibria of Collisionless Self-gravitating Matter with Nonvanishing Total Angular Momentum. *Heinz Wiechen & Harald J. Ziegler*. 408, 293, 86-F13 (1993)
- Encounters with Protostellar Disks. I. Disk Tilt and the Nonzero Solar Obliquity. *Clayton H. Heller*. 408, 337, 87-C11 (1993)
- Self-consistent Models for Triaxial Galaxies with Flat Rotation Curves: The Disk Case. *Konrad Kuijken*. 409, 68, 97-G1 (1993)
- Mapping Spherical Potentials with Discrete Radial Velocities. *David Merritt & Prasenjit Saha*. 409, 75, 97-G10 (1993)
- Galactic Bars with Central Mass Concentrations: Three-dimensional Dynamics. *Hashima Hasan, Daniel Pfenniger, & Colin Norman*. 409, 91, 98-B1 (1993)
- Postcollapse Evolution of Globular Clusters Dominated by Tidal Binary Heating. *Hyung Mok Lee & Jeremiah P. Ostriker*. 409, 617, 106-F3 (1993)
- Nonlocal and Collective Relaxation in Stellar Systems. *Martin D. Weinberg*. 410, 543, 120-D8 (1993)

COMETS: GENERAL

The OH Distribution in Cometary Atmospheres: A Collisional Monte Carlo Model for Heavy Species. *Michael R. Combi, Brent J. Bos, & William H. Smyth*. 408, 668, 93-E1 (1993)

Numerical Solution of Wave Equations for the Stability of the Inner Cometo-Sheath. *Krishna M. Srivastava, Bruce T. Tsurutani, & Bruce E. Goldstein*. 409, 782, 108-G7 (1993)

COMETS: INDIVIDUAL

Name: Halley

P/Halley: Effects of Time-dependent Production Rates on Spatial Emission Profiles. *Michael R. Combi & Uwe Fink*. 409, 790, 109-A1 (1993)

CONDUCTION

Magnetic Field Decay from the Core of Neutron Stars: Effects of Interpinning of $^3\text{P}_2$ Neutron Superfluid and $^1\text{S}_0$ Proton Superconducting Fluid. *K. Y. Ding, K. S. Cheng, & H. F. Chau*. 408, 167, 85-B11 (1993)

CONVECTION

Neutron Star Dynamos and the Origins of Pulsar Magnetism. *Christopher Thompson & Robert C. Duncan*. 408, 194, 85-E4 (1993)

Ionization Effects in Three-dimensional Solar Granulation Simulations. *Mark P. Rast, Åke Nordlund, Robert F. Stein, & Juri Toomre*. 408, L53, 89-D11 (1993)

Dynamical Instability as the Cause of the Massive Outbursts in η Carinae and Other Luminous Blue Variables. *Richard B. Stothers & Chao-wen Chin*. 408, L85, 95-C5 (1993)

On Partial Mixing Zones in Horizontal-Branch Stellar Cores. *Ben Dorman & Robert T. Rood*. 409, 387, 101-G3 (1993)

Energy Generation in Convective Shells of Low-Mass, Low-Metallicity Asymptotic Giant Branch Stars. *Grant Bazan & John C. Lattanzio*. 409, 762, 108-E6 (1993)

COSMIC BACKGROUND RADIATION

Cross-Correlation between the 170 GHz Survey Map and the COBE Differential Microwave Radiometer First-Year Maps. *Ken Ganga, Ed Cheng, Stephan Meyer, & Lyman Page*. 410, L57, 125-E1 (1993)

COSMOLOGY: COSMIC MICROWAVE BACKGROUND

Anisotropy of Cosmic Background Radiation from a Spherical Clustering on Large Scales. *Li-Zhi Fang & Xiang-Ping Wu*. 408, 25, 83-D3 (1993)

Uncertainty of the Cosmic Background Explorer Quadrupole Detection. *Philip B. Stark*. 408, L73, 95-B1 (1993)

Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky*. 409, 1, 97-B1 (1993)

Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5 Scale near the Star μ Pegasi. *P. Meinhold, A. Clapp, M. Devlin, M. Fischer, J. Gundersen, W. Holmes, A. Lange, P. Lubin, P. Richards, & G. Smoot*. 409, L1, 104-A8 (1993)

Cold Dark Matter and Degree-Scale Cosmic Microwave Background Anisotropy Statistics after COBE. *Krzysztof M. Górski, Radosław Stompór, & Roman Juszkiewicz*. 410, L1, 117-F1 (1993)

A Quasi-Steady State Cosmological Model with Creation of Matter. *F. Hoyle, G. Burbidge, & J. V. Narlikar*. 410, 437, 119-B7 (1993)

Tilted Cold Dark Matter Models Confront the Cosmic Microwave Background and the Galaxy Peculiar Velocity Field. *Pio Francesco Muciaccia, Simona Mei, Giancarlo de Gasperis, & Nicola Vittorio*. 410, L61, 125-E7 (1993)

Experiment-specific Cosmic Microwave Background Calculations Made Easier: Approximation Formula for Smoothed $\delta T/T$ Windows. *Krzysztof M. Górski*. 410, L65, 125-E13 (1993)

COSMOLOGY: DARK MATTER

Significant Cluster Correlations at $30 h^{-1}$ Mpc: Can Standard Models Be Ruled Out? *Scot S. Olivier, Joel R. Primack, George R. Blumenthal, & Avishai Dekel*. 408, 17, 83-C7 (1993)

On the Origin of H I Absorption Systems of Quasars. *Izumi Murakami & Satoru Ikeuchi*. 409, 42, 97-E1 (1993)

Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5 Scale near the Star μ Pegasi. *P. Meinhold, A. Clapp, M. Devlin, M. Fischer, J. Gundersen, W. Holmes, A. Lange, P. Lubin, P. Richards, & G. Smoot*. 409, L1, 104-A8 (1993)

The Hyades Cluster-Supercluster Connection: Evidence for a Local Concentration of Dark Matter. *Stefano Casertano, Icko Iben, Jr., & Aaron Shiels*. 410, 90, 113-C5 (1993)

Controlled Experiments in Cosmological Gravitational Clustering. *Adrian L. Melott & Sergei F. Shandarin*. 410, 469, 119-E1 (1993)

Tilted Cold Dark Matter Models Confront the Cosmic Microwave Background and the Galaxy Peculiar Velocity Field. *Pio Francesco Muciaccia, Simona Mei, Giancarlo de Gasperis, & Nicola Vittorio*. 410, L61, 125-E7 (1993)

COSMOLOGY: DIFFUSE RADIATION

Deep Galaxy Count Predictions in the Radio, Infrared, and X-Ray Spectral Bands. *Marie-Agnes Treyer & Joseph Silk*. 408, L1, 88-E1 (1993)

On the Origin of the Soft X-Ray Background. *Q. Daniel Wang & Richard McCray*. 409, L37, 111-B8 (1993)

Self-absorbed Active Galactic Nuclei and the Cosmic X-Ray Background. *Piero Madau, Gabriele Ghisellini, & A. C. Fabian*. 410, L7, 117-F8 (1993)

COSMOLOGY: DISTANCE SCALE

The Distance to Nearby Galaxy NGC 3109 Based on the Tip of the Red Giant Branch. *Myung Gyoan Lee*. 408, 409, 90-C8 (1993)

The Dependence of the Brightness Fluctuation Distance Indicator on Stellar Population Age and Metallicity. *Guy Worthey*. 409, 530, 105-E3 (1993)

Galaxy Colors in Distant Clusters as a Test for the World Model. *Alberto Buzzoni, Guido Chincarini, & Emilio Molinari*. 410, 499, 119-G9 (1993)

COSMOLOGY: GRAVITATIONAL LENSING

The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars. *D. Maoz, J. N. Bahcall, D. P. Schneider, N. A. Bahcall, S. Djorgovski, R. Doxsey, A. Gould, S. Kirhakos, G. Meylan, & B. Yan*. 409, 28, 97-D1 (1993)

Further Radio Investigations of Gravitational Lensing in MG 0414+0534. *C. A. Katz & J. N. Hewitt*. 409, L9, 104-B11 (1993)

The Velocity Dispersion of the Caustic Network Due to Random Motion of Individual Stars in the Lensing Galaxy. *Tomislav Kundić, Hans J. Wilt, & Kyongae Chang*. 409, 537, 105-E13 (1993)

Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian*. 410, 21, 112-D1 (1993)

COSMOLOGY: LARGE-SCALE STRUCTURE OF UNIVERSE

Anisotropy of Cosmic Background Radiation from a Spherical Clustering on Large Scales. *Li-Zhi Fang & Xiang-Ping Wu*. 408, 25, 83-D3 (1993)

Kurtosis, Skewness, and Non-Gaussian Cosmological Density Perturbations. *Xiaochun Luo & David N. Schramm*. 408, 33, 83-E1 (1993)

Higher Order Statistics of the Galaxy Distribution Using Generating Functions. *István Szapudi & Alexander S. Szalay*. 408, 43, 83-E13 (1993)

The Cosmic Mach Number: Direct Comparisons of Observations and Models. *Michael A. Strauss, Renyue Cen, & Jeremiah P. Ostriker*. 408, 389, 90-B1 (1993)

Beyond the Zel'dovich Approximation. *M. Lachièze-Rey*. 408, 403, 90-C1 (1993)

Redshift Space Clustering of Galaxies and Cold Dark Matter Model. *Neta A. Bahcall, Renyue Cen, & Mirt Gramann*. 408, L77, 95-B7 (1993)

Measurements of the Anisotropy of the Cosmic Background Radiation at 0.5 Scale near the Star μ Pegasi. *P. Meinhold, A. Clapp, M. Devlin, M. Fischer, J. Gundersen, W. Holmes, A. Lange, P. Lubin, P. Richards, & G. Smoot*. 409, L1, 104-A8 (1993)

Nonlinear Properties and Time Evolution of Gravitational Galaxy Clustering. *William C. Saslaw & Ravi K. Sheth*. 409, 504, 105-B13 (1993)

Objective Detection of Voids and High-Density Structures in the First CfA Redshift Survey Slice. *E. Slezak, V. de Lapparent, & A. Bijaoui*. 409, 517, 105-D1 (1993)

Void Evolution and the Large-Scale Structure. *John Dubinski, L. Nicolaci da Costa, D. S. Goldwirth, M. Lecar, & T. Piran*. 410, 458, 119-D1 (1993)

- Controlled Experiments in Cosmological Gravitational Clustering. *Adrian L. Melott & Sergei F. Shandarin.* 410, 469, 119-E1 (1993)
- Zel'dovich Approximation and the Probability Distribution for the Smoothed Density Field in the Nonlinear Regime. *T. Padmanabhan & K. Subramanian.* 410, 482, 119-F1 (1993)
- COSMOLOGY: OBSERVATIONS**
- Deep Galaxy Count Predictions in the Radio, Infrared, and X-Ray Spectral Bands. *Marie-Agnes Treyer & Joseph Silk.* 408, L1, 88-E1 (1993)
- The Cosmic Mach Number: Direct Comparisons of Observations and Models. *Michael A. Strauss, Renyue Cen, & Jeremiah P. Ostriker.* 408, 389, 90-B1 (1993)
- Measurements of the Cosmic Microwave Background Temperature at 1.47 GHz. *M. Bensadoun, M. Bersanelli, G. De Amici, A. Kogut, S. M. Levin, M. Limon, G. F. Smoot, & C. Witebsky.* 409, 1, 97-B1 (1993)
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer.* 409, 14, 97-C1 (1993)
- The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars. *D. Maoz, J. N. Bahcall, D. P. Schneider, N. A. Bahcall, S. Djorgovski, R. Daxey, A. Gould, S. Kirhakos, G. Meylan, & B. Yanny.* 409, 28, 97-D1 (1993)
- On the Origin of the Soft X-Ray Background. *Q. Daniel Wang & Richard McCray.* 409, L37, 111-B8 (1993)
- Quasar Clustering on Large Scales. *H. J. Mo & L. Z. Fang.* 410, 493, 119-G1 (1993)
- Galaxy Colors in Distant Clusters as a Test for the World Model. *Alberto Buzzoni, Guido Chincarini, & Emilio Molinari.* 410, 499, 119-G9 (1993)
- The Signature of the Cosmological Redshift in Population Studies of Gamma-Ray Burst Spectra. *J. J. Brainerd.* 410, 507, 120-A5 (1993)
- COSMOLOGY: THEORY**
- Clusters and Groups of Galaxies as Cosmological Probes. *Haruhiko Ueda, Makoto Itoh, & Yasushi Suto.* 408, 3, 83-B5 (1993)
- Significant Cluster Correlations at 30 h^{-1} Mpc: Can Standard Models Be Ruled Out? *Scot S. Olivier, Joel R. Primack, George R. Blumenthal, & Avishai Dekel.* 408, 17, 83-C7 (1993)
- Anisotropy of Cosmic Background Radiation from a Spherical Clustering on Large Scales. *Li-Zhi Fang & Xiang-Ping Wu.* 408, 25, 83-D3 (1993)
- Kurtosis, Skewness, and Non-Gaussian Cosmological Density Perturbations. *Xiaochun Luo & David N. Schramm.* 408, 33, 83-E1 (1993)
- Understanding Soft Gamma-Ray Repeaters in the Context of the Extragalactic Radio Pulsar Origin of Gamma-Ray Bursts. *Fulvio Melia & Marco Fatuzzo.* 408, L9, 88-F1 (1993)
- Beyond the Zel'dovich Approximation. *M. Lachièze-Rey.* 408, 403, 90-C1 (1993)
- Redshift Space Clustering of Galaxies and Cold Dark Matter Model. *Neeta A. Bahcall, Renyue Cen, & Mirt Gramann.* 408, L77, 95-B7 (1993)
- Cosmic Turbulence Revisited. *I. Goldman & V. M. Canuto.* 409, 495, 105-B1 (1993)
- A Quasi-Steady State Cosmological Model with Creation of Matter. *F. Hoyle, G. Burbidge, & J. V. Narlikar.* 410, 437, 119-B7 (1993)
- Void Evolution and the Large-Scale Structure. *John Dubinski, L. Nicolaci da Costa, D. S. Goldwirth, M. Lecar, & T. Piran.* 410, 458, 119-D1 (1993)
- Controlled Experiments in Cosmological Gravitational Clustering. *Adrian L. Melott & Sergei F. Shandarin.* 410, 469, 119-E1 (1993)
- Zel'dovich Approximation and the Probability Distribution for the Smoothed Density Field in the Nonlinear Regime. *T. Padmanabhan & K. Subramanian.* 410, 482, 119-F1 (1993)
- A Static Stable Universe. *David F. Crawford.* 410, 488, 119-F9 (1993)
- DENSE MATTER**
- Magnetic Field Decay from the Core of Neutron Stars: Effects of Interpenetration of ${}^3\text{P}_2$ Neutron Superfluid and ${}^1\text{S}_0$ Proton Superconducting Fluid. *K. Y. Ding, K. S. Cheng, & H. F. Chau.* 408, 167, 85-B11 (1993)
- Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibasaki, Ken'ichi Nomoto, & Sachiko Tsuruta.* 408, 186, 85-D7 (1993)
- Postglitch Relaxation of the Vela Pulsar after Its First Eight Large Glitches: A Reevaluation with the Vortex Creep Model. *M. Ali Alpar, H. F. Chau, K. S. Cheng, & David Pines.* 409, 345, 101-D1 (1993)
- DIFFUSION**
- Light-induced Drift and Abundance Anomalies. *F. LeBlanc & G. Michaud.* 408, 251, 86-C1 (1993)
- Magnetic Diffusion Due to Supernova Explosions and Superbubbles in the Galactic Disk. *Katia Ferrière.* 409, 248, 100-C1 (1993)
- ECLIPSES**
- Solar Coronal Structure near the Time of the 1991 July 11 Total Solar Eclipse. *D. G. Sime & J. Streete.* 408, 368, 87-F6 (1993)
- EDITORIALS, NOTICES**
- Announcement: Additional Associate Editors. *Helmut A. Abt.* 408, 1, 83-B1 (1993)
- ELEMENTARY PARTICLES**
- Toward a Unified Classical Model of the Sun: On the Sensitivity of Neutrinos and Helioseismology to the Microscopic Physics. *Sylvaine Turck-Chièze & Ilidio Lopes.* 408, 347, 87-D10 (1993)
- Neutrino Decay and the Heat Budget of the Warm Interstellar Medium. *D. W. Sciama.* 409, L25, 104-D9 (1993)
- VLA Observations of 1E 1740.7-2942: A Search for Radio Recombination Lines of Positronium. *K. R. Anantharamaiah, K. S. Dwarakanath, D. Morris, W. M. Goss, & V. Radhakrishnan.* 410, 110, 113-E1 (1993)
- Stellar Core Collapse: A Boltzmann Treatment of Neutrino-Electron Scattering. *Anthony Mezzacappa & Stephen W. Bruenn.* 410, 740, 123-A7 (1993)
- ERRATA, ADDENDA**
- Imaging Spectrophotometry of the Orion Nebula Core. I. Emission-Line Mapping and Physical Conditions: Erratum. *Richard W. Pogge, J. Michael Owen, & Bruce Atwood.* 408, 758, 94-E9 (1993) (Orig. paper in 399, 147, 197-A9 (1992))
- The He II 1640 Å Multiplet Observed from Solar Prominences: Erratum. *J. M. Laming & U. Feldman.* 409, 869, 110-A9 (1993) (Orig. paper in 403, 434, 19-B11 (1993))
- GALAXIES: ABUNDANCES**
- Ar/S. *Christopher C. Stevenson, Marshall L. McCall, & Douglas L. Welch.* 408, 460, 90-G11 (1993)
- Star Trapping and Metallicity Enrichment in Quasars and Active Galactic Nuclei. *Pawel Artymowicz, D. N. C. Lin, & E. Joseph Wampler.* 409, 592, 106-C12 (1993)
- The Ionizing Radiation of Seyfert 2 Galactic Nuclei. *Luis C. Ho, Joseph C. Shields, & Alexei V. Filippenko.* 410, 567, 120-F9 (1993)
- GALAXIES: ACTIVE**
- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548. *M. Dietrich, W. Kollatschny, B. M. Peterson, J. Bechtold, R. Bertram, N. G. Bochkarev, T. A. Boroson, T. E. Carone, M. Elvis, A. V. Filippenko, C. M. Gaskell, J. P. Huchra, J. B. Hutchings, A. P. Koratkar, K. T. Korista, N. J. Lae, A. Laor, G. M. MacAlpine, M. A. Malkan, C. Mendes de Oliveira, H. Netzer, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, E. I. Rosenblatt, A. I. Shepovalova, J. C. Shields, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, S. Veilleux, R. M. Wagner, B. J. Wilkes, B. J. Wills, & D. Wills.* 408, 416, 90-D1 (1993)
- High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman.* 409, L5, 104-B1 (1993)
- Star Trapping and Metallicity Enrichment in Quasars and Active Galactic Nuclei. *Pawel Artymowicz, D. N. C. Lin, & E. Joseph Wampler.* 409, 592, 106-C12 (1993)
- Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell.* 410, 29, 112-D11 (1993)
- The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston.* 410, 56, 112-G4 (1993)

- The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne.* 410, 534, 120-C11 (1993)
- The Ionizing Radiation of Seyfert 2 Galactic Nuclei. *Luis C. Ho, Joseph C. Shields, & Alexei V. Filippenko.* 410, 567, 120-F9 (1993)
- The High-Energy Diffuse Cosmic Gamma-Ray Background Radiation from Blazars. *F. W. Stecker, M. H. Salamon, & M. A. Malkan.* 410, L71, 125-F5 (1993)
- GALAXIES: BL LACERTAE OBJECTS: GENERAL**
- A Spectral Study of Four X-Ray-selected BL Lacertae Objects with EXOSAT. *R. M. Sambruna, P. Barr, L. Maraschi, G. Tagliaferri, & A. Treves.* 408, 452, 90-G1 (1993)
- Is 1308+326 a BL Lacertae Object or a Quasar? *D. C. Gabuzda, R. I. Kolgaard, D. H. Roberts, & J. F. C. Wardle.* 410, 39, 112-E12 (1993)
- GALAXIES: BL LACERTAE OBJECTS: INDIVIDUAL**
- Name: Markarian 421**
- Compton Scattering and the Gamma-Ray Power-Law Spectrum in Markarian 421. *Andrzej A. Zdziarski & Julian H. Krolik.* 409, L33, 111-B1 (1993)
- Alphanumeric: PKS 0537-441**
- Gamma Radiation from Blazar PKS 0537-441. *D. J. Thompson, D. L. Bertsch, C. E. Fichtel, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, P. L. Nolan, K. Pinkau, E. J. Schneid, & P. Sreekumar.* 410, 87, 113-C1 (1993)
- Alphanumeric: PKS 2155-304**
- The Galactic Halo and Local Intergalactic Medium toward PKS 2155-304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo.* 409, 199, 99-D6 (1993)
- GALAXIES: CLUSTERING**
- Clusters and Groups of Galaxies as Cosmological Probes. *Haruhiko Ueda, Makoto Itoh, & Yasushi Suto.* 408, 3, 83-B5 (1993)
- Significant Cluster Correlations at $30 h^{-1}$ Mpc: Can Standard Models Be Ruled Out? *Scott S. Olivier, Joel R. Primack, George R. Blumenthal, & Avishai Dekel.* 408, 17, 83-C7 (1993)
- Compressive Tidal Heating of a Disk Galaxy in a Rich Cluster. *Monica Valluri.* 408, 57, 83-G1 (1993)
- X-Ray Spectra of 12 Distant Clusters of Galaxies. *Qingde Wang & John T. Stocke.* 408, 71, 84-A4 (1993)
- On the Thermal Stability of a Radiating Plasma Subject to Nonlocal Thermal Conduction. I. Linear Analysis. *E. Chun & R. Rosner.* 408, 678, 93-F1 (1993)
- Redshift Space Clustering of Galaxies and Cold Dark Matter Model. *Neta A. Bahcall, Renyue Cen, & Mirt Gramann.* 408, L77, 95-B7 (1993)
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer.* 409, 14, 97-C1 (1993)
- Nonlinear Properties and Time Evolution of Gravitational Galaxy Clustering. *William C. Saslaw & Ravi K. Sheh.* 409, 504, 105-B13 (1993)
- Objective Detection of Voids and High-Density Structures in the First CfA Redshift Survey Slice. *E. Slezak, V. de Lapparent, & A. Bijaoui.* 409, 517, 105-D1 (1993)
- Small-Scale Substructure in Relaxed Clusters. I. Statistical Characterization. *Eduard Salvador-Solé, Guillermo González-Casado, & José María Solanes.* 410, 1, 112-B1 (1993)
- Small-Scale Substructure in Relaxed Clusters. II. Clustering Model. *Guillermo González-Casado, José María Solanes, & Eduard Salvador-Solé.* 410, 15, 112-C8 (1993)
- Void Evolution and the Large-Scale Structure. *John Dubinski, L. Nicolaci da Costa, D. S. Goldwirth, M. Lecar, & T. Piran.* 410, 458, 119-D1 (1993)
- Controlled Experiments in Cosmological Gravitational Clustering. *Adrian L. Melott & Sergei F. Shandarin.* 410, 469, 119-E1 (1993)
- Quasar Clustering on Large Scales. *H. J. Mo & L. Z. Fang.* 410, 493, 119-G1 (1993)
- Galaxy Colors in Distant Clusters as a Test for the World Model. *Alberto Buzzoni, Guido Chincarini, & Emilio Molinari.* 410, 499, 119-G9 (1993)
- The Shapes of Brightest Cluster Galaxies. *Barbara S. Ryden, Tod R. Lauer, & Marc Postman.* 410, 515, 120-B1 (1993)
- Searching for a Far-Infrared Enhancement in Compact Groups of Galaxies. *Jack W. Sulentic & Duilia F. De Mello Rabaça.* 410, 520, 120-B8 (1993)
- GALAXIES: DISTANCES AND REDSHIFTS**
- The Cosmic Mach Number: Direct Comparisons of Observations and Models. *Michael A. Strauss, Renyue Cen, & Jeremiah P. Ostriker.* 408, 389, 90-B1 (1993)
- The Distance to Nearby Galaxy NGC 3109 Based on the Tip of the Red Giant Branch. *Myung Gyoong Lee.* 408, 409, 90-C8 (1993)
- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer.* 409, 14, 97-C1 (1993)
- The Dependence of the Brightness Fluctuation Distance Indicator on Stellar Population Age and Metallicity. *Guy Worthey.* 409, 530, 105-E3 (1993)
- Infrared Surface Brightness Fluctuations: K'-Band Observations of M31, M32, and the Distance to Maffei 1. *Gerard A. Luppino & John L. Tonry.* 410, 81, 113-B3 (1993)
- A Provisional RR Lyrae Distance Scale. *Norman R. Simon & Christine M. Clement.* 410, 526, 120-C1 (1993)
- GALAXIES: ELLIPTICAL AND LENTICULAR, CD**
- The Dependence of the Brightness Fluctuation Distance Indicator on Stellar Population Age and Metallicity. *Guy Worthey.* 409, 530, 105-E3 (1993)
- Evolution of Elliptical Galaxies. I. The Multiphase Model. *Federico Ferrini & Bianca Maria Poggianti.* 410, 44, 112-F4 (1993)
- Infrared Surface Brightness Fluctuations: K'-Band Observations of M31, M32, and the Distance to Maffei 1. *Gerard A. Luppino & John L. Tonry.* 410, 81, 113-B3 (1993)
- The Shapes of Brightest Cluster Galaxies. *Barbara S. Ryden, Tod R. Lauer, & Marc Postman.* 410, 515, 120-B1 (1993)
- GALAXIES: EVOLUTION**
- Compressive Tidal Heating of a Disk Galaxy in a Rich Cluster. *Monica Valluri.* 408, 57, 83-G1 (1993)
- X-Ray Spectra of 12 Distant Clusters of Galaxies. *Qingde Wang & John T. Stocke.* 408, 71, 84-A4 (1993)
- Deep Galaxy Count Predictions in the Radio, Infrared, and X-Ray Spectral Bands. *Marie-Agnes Treyer & Joseph Silk.* 408, L1, 88-E1 (1993)
- Understanding Soft Gamma-Ray Repeaters in the Context of the Extragalactic Radio Pulsar Origin of Gamma-Ray Bursts. *Fulvio Melia & Marco Fatuzzo.* 408, L9, 88-F1 (1993)
- Galactic Bars with Central Mass Concentrations: Three-dimensional Dynamics. *Hashima Hasan, Daniel Pfenniger, & Colin Norman.* 409, 91, 98-B1 (1993)
- 21 Centimeter Study of Spiral Galaxies in Clusters. III. Neutral Gas Content, Star Formation, and Radio Continuum Properties. *Marco Scodreggio & Giuseppe Gavazzi.* 409, 110, 98-C8 (1993)
- Structure of Merger Remnants. II. Progenitors with Rotating Bulges. *Lars Hernquist.* 409, 548, 105-F12 (1993)
- An Optically Luminous Radio Galaxy at $z = 3.22$ and the K-z Diagram at High Redshift. *Stephen A. Eales, Steve Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy.* 409, 578, 106-B7 (1993)
- Evolution of Elliptical Galaxies. I. The Multiphase Model. *Federico Ferrini & Bianca Maria Poggianti.* 410, 44, 112-F4 (1993)
- GALAXIES: FORMATION**
- Clusters and Groups of Galaxies as Cosmological Probes. *Haruhiko Ueda, Makoto Itoh, & Yasushi Suto.* 408, 3, 83-B5 (1993)
- Globular Clusters and cD Formation: The Case of M87. *Dean E. McLaughlin, William E. Harris, & David A. Hanes.* 409, L45, 111-C8 (1993)
- Small-Scale Substructure in Relaxed Clusters. I. Statistical Characterization. *Eduard Salvador-Solé, Guillermo González-Casado, & José María Solanes.* 410, 1, 112-B1 (1993)

Small-Scale Substructure in Relaxed Clusters. II. Clustering Model. *Guillermo González-Casado, José María Solanes, & Eduard Salvador-Solé.* 410, 15, 112-C8 (1993)

Tilted Cold Dark Matter Models Confront the Cosmic Microwave Background and the Galaxy Peculiar Velocity Field. *Pio Francesco Muciaccia, Simona Mei, Giancarlo de Gasperi, & Nicola Vittorio.* 410, L61, 125-E7 (1993)

GALAXIES: FUNDAMENTAL PARAMETERS

Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548. *M. Dietrich, W. Kollatschny, B. M. Peterson, J. Bechtold, R. Bertram, N. G. Bochkarev, T. A. Boroson, T. E. Carone, M. Elvis, A. V. Filippenko, C. M. Gaskell, J. P. Huchra, J. B. Hutchings, A. P. Koratkar, K. T. Korista, N. J. Lane, A. Laor, G. M. MacAlpine, M. A. Malkan, C. Mendes de Oliveira, H. Netzer, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, E. I. Rosenblatt, A. I. Shapovalova, J. C. Shields, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, S. Veilleux, R. M. Wagner, B. J. Wilkes, B. J. Wills, & D. Wills.* 408, 416, 90-D1 (1993)

The Dependence of the Brightness Fluctuation Distance Indicator on Stellar Population Age and Metallicity. *Guy Worthey.* 409, 530, 105-E3 (1993)

GALAXIES: INDIVIDUAL

Messier Number: M31

The Hot Stellar Component in Elliptical Galaxies and Spiral Bulges. I. The Far-Ultraviolet Spectrum of the Bulge of M31. *Henry C. Ferguson & Arthur F. Davidsen.* 408, 92, 84-C4 (1993)

Imaging of Fields in the Inner Halo and Outer Disk of M31. *T. J. Davidge.* 409, 190, 99-C8 (1993)

The First Detection of a Collapsed Core Globular Cluster in M31. *O. Bendinelli, C. Cacciari, S. Djorgovski, L. Federici, F. R. Ferraro, F. Fusi Pecci, G. Parmeggiani, N. Weir, & F. Zavatti.* 409, L17, 104-C7 (1993)

Detection of CO Emission from Massive Molecular Clouds in the Inner Disk of M31. *Ronald J. Allen & J. Lequeux.* 410, L15, 117-G7 (1993)

High-Resolution X-Ray Observations of the Central Region of M31 with the ROSAT Satellite. *F. A. Primini, W. Forman, & C. Jones.* 410, 615, 121-C12 (1993)

Messier Number: M32

The Hot Stellar Component in Elliptical Galaxies and Spiral Bulges. I. The Far-Ultraviolet Spectrum of the Bulge of M31. *Henry C. Ferguson & Arthur F. Davidsen.* 408, 92, 84-C4 (1993)

Messier Number: M51

Density Wave Kinematics and Giant Molecular Association Formation in M51. *Richard J. Rand.* 410, 68, 113-A3 (1993)

Messier Number: M81

Models for the Magnetic Field of M81. *David Moss, Axel Brandenburg, Karl Johan Donner, & Magnus Thomasson.* 409, 179, 99-B10 (1993)

Messier Number: M87

Globular Clusters and cD Formation: The Case of M87. *Dean E. McLaughlin, William E. Harris, & David A. Hanes.* 409, L45, 111-C8 (1993)

NGC Number: NGC 315

VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle.* 408, 81, 84-B4 (1993)

NGC Number: NGC 1068

High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman.* 409, L5, 104-B1 (1993)

NGC Number: NGC 1097

Double-peaked Broad Line Emission from the LINER Nucleus of NGC 1097. *Thaisa Storchi-Bergmann, Jack A. Baldwin, & Andrew S. Wilson.* 410, L11, 117-G1 (1993)

NGC Number: NGC 1275

Near-Infrared Spectroscopy of the Peculiar Giant Elliptical NGC 1275. *Kimiaki Kawara & Yoshiaki Taniguchi.* 410, L19, 117-G13 (1993)

NGC Number: NGC 1399

The Hot Stellar Component in Elliptical Galaxies and Spiral Bulges. I. The Far-Ultraviolet Spectrum of the Bulge of M31. *Henry C. Ferguson & Arthur F. Davidsen.* 408, 92, 84-C4 (1993)

NGC Number: NGC 3109

The Distance to Nearby Galaxy NGC 3109 Based on the Tip of the Red Giant Branch. *Myung Gyoong Lee.* 408, 409, 90-C8 (1993)

NGC Number: NGC 4395

HST Observations of NGC 4395, the Least Luminous Seyfert 1 Nucleus: Evidence against the Starburst Hypothesis for Broad-lined Active Galactic Nuclei. *Alexei V. Filippenko, Luis C. Ho, & Wallace L. W. Sargent.* 410, L75, 125-F11 (1993)

NGC Number: NGC 4568

The Radio Emission from the Type Ic Supernova SN 1990B. *Schuyler D. Van Dyk, Richard A. Sramek, Kurt W. Weiler, & Nino Panagia.* 409, 162, 99-A3 (1993)

NGC Number: NGC 4945

X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai.* 409, 155, 98-G9 (1993)

NGC Number: NGC 5548

Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548. *M. Dietrich, W. Kollatschny, B. M. Peterson, J. Bechtold, R. Bertram, N. G. Bochkarev, T. A. Boroson, T. E. Carone, M. Elvis, A. V. Filippenko, C. M. Gaskell, J. P. Huchra, J. B. Hutchings, A. P. Koratkar, K. T. Korista, N. J. Lane, A. Laor, G. M. MacAlpine, M. A. Malkan, C. Mendes de Oliveira, H. Netzer, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, E. I. Rosenblatt, A. I. Shapovalova, J. C. Shields, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, S. Veilleux, R. M. Wagner, B. J. Wilkes, B. J. Wills, & D. Wills.* 408, 416, 90-D1 (1993)

NGC Number: NGC 5728

The Circumnuclear Region of NGC 5728. *S. Arribas & E. Mediavilla.* 410, 552, 120-E5 (1993)

NGC Number: NGC 6814

Features of the Fluorescent Iron Line from Highly Inclined Disks: Some Possible Examples for NGC 6814. *G. Bao.* 409, L41, 111-C1 (1993)

NGC Number: NGC 7753-7752

The Interacting System NGC 7753-7752 (Arp 86). I. BVRI Photometry. *Eija Laurikainen, Heikki Salo, & Antonio Aparicio.* 410, 574, 120-G3 (1993)

The Interacting System NGC 7753-7752 (Arp 86). II. N-Body Modeling. *Heikki Salo & Eija Laurikainen.* 410, 586, 121-A6 (1993)

Name: Maffei 1

Infrared Surface Brightness Fluctuations: K'-Band Observations of M31, M32, and the Distance to Maffei 1. *Gerard A. Luppino & John L. Tonry.* 410, 81, 113-B3 (1993)

Alphanumeric: 3C 338

VLBI Observations of a Complete Sample of Radio Galaxies. III. The Two-sided Milliarcsecond Structure of 3C 338. *L. Feretti, G. Comoretto, G. Giovannini, T. Venturi, & A. E. Wehrle.* 408, 446, 90-F7 (1993)

Alphanumeric: OQ 208

The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston.* 410, 56, 112-G4 (1993)

Alphanumeric: I Zw 18

Ar/S. Christopher C. Stevenson, Marshall L. McCall, & Douglas L. Welch. 408, 460, 90-G11 (1993)

Alphanumeric: II Zw 40

Ar/S. Christopher C. Stevenson, Marshall L. McCall, & Douglas L. Welch. 408, 460, 90-G11 (1993)

GALAXIES: INTERACTIONS

- Compressive Tidal Heating of a Disk Galaxy in a Rich Cluster. *Monica Valluri*. 408, 57, 83-G1 (1993)
- A Massive Binary Black Hole in 1928+738? *Nico Roos, Jelle S. Kaastra, & Christian A. Hummel*. 409, 130, 98-E8 (1993)
- Structure of Merger Remnants. II. Progenitors with Rotating Bulges. *Lars Hernquist*. 409, 548, 105-F12 (1993)
- The Shapes of Brightest Cluster Galaxies. *Barbara S. Ryden, Tod R. Lauer, & Marc Postman*. 410, 515, 120-B1 (1993)
- The Interacting System NGC 7753–7752 (Arp 86). I. *BVR* Photometry. *Eija Laurikainen, Heikki Salo, & Antonio Aparicio*. 410, 574, 120-G3 (1993)
- The Interacting System NGC 7753–7752 (Arp 86). II. *N*-Body Modeling. *Heikki Salo & Eija Laurikainen*. 410, 586, 121-A6 (1993)

GALAXIES: INTERGALACTIC MEDIUM

- X-Ray Spectra of 12 Distant Clusters of Galaxies. *Qingde Wang & John T. Stocke*. 408, 71, 84-A4 (1993)

GALAXIES: IRREGULAR

- Ar/S. *Christopher C. Stevenson, Marshall L. McCall, & Douglas L. Welch*. 408, 460, 90-G11 (1993)

GALAXIES: ISM

- Molecular Gas in Powerful Radio Galaxies Detected by *IRAS*. *J. M. Mazzarella, J. R. Graham, D. B. Sanders, & S. Djorgovski*. 409, 170, 99-A13 (1993)
- Evolution of Elliptical Galaxies. I. The Multiphase Model. *Federico Ferrini & Bianca Maria Poggianti*. 410, 44, 112-F4 (1993)
- Detection of CO Emission from Massive Molecular Clouds in the Inner Disk of M31. *Ronald J. Allen & J. Lequeux*. 410, L15, 117-G7 (1993)
- Near-Infrared Spectroscopy of the Peculiar Giant Elliptical NGC 1275. *Kimiki Kawara & Yoshiaki Taniguchi*. 410, L19, 117-G13 (1993)

GALAXIES: JETS

- A Two-dimensional Relativistic ($\Gamma = 3.25$) Jet Simulation. *Maurice H. P. M. van Putten*. 408, L21, 88-G8 (1993)
- Flow Dynamics and Bending of Wide-Angle Tailed Radio Sources. *Aileen A. O'Donoghue, Jean A. Eilek, & Frazer N. Owen*. 408, 428, 90-E1 (1993)
- VLBI Observations of a Complete Sample of Radio Galaxies. III. The Two-sided Milliarcsecond Structure of 3C 338. *L. Feretti, G. Comoretto, G. Giovannini, T. Venturi, & A. E. Wehrle*. 408, 446, 90-F7 (1993)
- On the Separation of the Flaring Component's Emission in Variable Compact Extragalactic Radio Sources: Results from a Simple Shocked Relativistic Jet Model. *D. J. van der Walt*. 409, 126, 98-E3 (1993)
- A Massive Binary Black Hole in 1928+738? *Nico Roos, Jelle S. Kaastra, & Christian A. Hummel*. 409, 130, 98-E8 (1993)
- Double-peaked Broad Line Emission from the LINER Nucleus of NGC 1097. *Thaisa Storch-Bergmann, Jack A. Baldwin, & Andrew S. Wilson*. 410, L11, 117-G1 (1993)
- Three-dimensional Simulations of Protostellar Jets. *Elisabete M. de Gouveia Dal Pino & Willy Benz*. 410, 686, 122-B13 (1993)

GALAXIES: KINEMATICS AND DYNAMICS

- Compressive Tidal Heating of a Disk Galaxy in a Rich Cluster. *Monica Valluri*. 408, 57, 83-G1 (1993)
- Flow Dynamics and Bending of Wide-Angle Tailed Radio Sources. *Aileen A. O'Donoghue, Jean A. Eilek, & Frazer N. Owen*. 408, 428, 90-E1 (1993)
- Softening in *N*-Body Simulations of Collisionless Systems. *Charles C. Dyer & Peter S. S. Ip*. 409, 60, 97-F7 (1993)
- Self-consistent Models for Triaxial Galaxies with Flat Rotation Curves: The Disk Case. *Konrad Kuijken*. 409, 68, 97-G1 (1993)
- Mapping Spherical Potentials with Discrete Radial Velocities. *David Merritt & Prasenjit Saha*. 409, 75, 97-G10 (1993)
- Galactic Bars with Central Mass Concentrations: Three-dimensional Dynamics. *Hashima Hasan, Daniel Pfenniger, & Colin Norman*. 409, 91, 98-B1 (1993)
- The Velocity Dispersion of the Caustic Network Due to Random Motion of Individual Stars in the Lensing Galaxy. *Tomislav Kundić, Hans J. Witt, & Kyongae Chang*. 409, 537, 105-E13 (1993)

- Structure of Merger Remnants. II. Progenitors with Rotating Bulges. *Lars Hernquist*. 409, 548, 105-F12 (1993)

- Self-consistent Models for Galactic Halos. *Martin Schwarzschild*. 409, 563, 106-A3 (1993)

- The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston*. 410, 56, 112-G4 (1993)

- Density Wave Kinematics and Giant Molecular Association Formation in M51. *Richard J. Rand*. 410, 68, 113-A3 (1993)

- Nonlocal and Collective Relaxation in Stellar Systems. *Martin D. Weinberg*. 410, 543, 120-D8 (1993)

- The Circumnuclear Region of NGC 5728. *S. Arribas & E. Mediavilla*. 410, 552, 120-E5 (1993)

GALAXIES: LOCAL GROUP

- The Distance to Nearby Galaxy NGC 3109 Based on the Tip of the Red Giant Branch. *Myung Gyoong Lee*. 408, 409, 90-C8 (1993)

- Unbound Dwarf Spheroidal Galaxies and the Mass of the Milky Way. *Jeffrey R. Kuhn*. 409, L13, 104-C1 (1993)

- Infrared Surface Brightness Fluctuations: *K'*-Band Observations of M31, M32, and the Distance to Maffei 1. *Gerard A. Luppino & John L. Tonry*. 410, 81, 113-B3 (1993)

- The Bulge of M33. *Dante Minniti, Edward W. Olszewski, & Marcia Rieke*. 410, L79, 125-G3 (1993)

GALAXIES: MAGELLANIC CLOUDS

- The Age of the Large Magellanic Cloud Cluster NGC 2031. *J. R. Mould, D. A. Xystus, & G. S. Da Costa*. 408, 108, 84-D8 (1993)

- Diffuse Gamma-Ray Emission from Pulsars in the Large Magellanic Cloud. *Dieter H. Hartmann, Lawrence E. Brown, & Neil Schnepf*. 408, L13, 88-F8 (1993)

- Theoretical Models for Massive Stars in Young Magellanic Cloud Stellar Clusters. *Enzo Brocato & Vittorio Castellani*. 410, 99, 113-D1 (1993)

- ROSAT Observations of the Large Magellanic Cloud Pulsar PSR 0540–69. *John P. Finley, Hakkı Ögelman, Günther Hasinger, & Joachim Trümper*. 410, 323, 116-B1 (1993)

- A Provisional RR Lyrae Distance Scale. *Norman R. Simon & Christine M. Clement*. 410, 526, 120-C1 (1993)

GALAXIES: NUCLEI

- VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle*. 408, 81, 84-B4 (1993)

- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548. *M. Dietrich, W. Kollatschny, B. M. Peterson, J. Bechtold, R. Bertram, N. G. Bochkarev, T. A. Boroson, T. E. Carone, M. Elvis, A. V. Filippenko, C. M. Gaskell, J. P. Huchra, J. B. Hutchings, A. P. Koratkar, K. T. Korista, N. J. Lane, A. Laor, G. M. MacAlpine, M. A. Malkan, C. Mendes de Oliveira, H. Netzer, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, E. I. Rosenblatt, A. I. Shapovalova, J. C. Shields, H. A. Smith, P. S. Smith, W.-H. Sun, Ü. Thiele, S. Veilleux, R. M. Wagner, B. J. Wilkes, B. J. Wills, & D. Wills*. 408, 416, 90-D1 (1993)

- Galactic Bars with Central Mass Concentrations: Three-dimensional Dynamics. *Hashima Hasan, Daniel Pfenniger, & Colin Norman*. 409, 91, 98-B1 (1993)

- Imaging of Luminous Infrared Galaxies at 3.4 Microns. *Shudong Zhou, C. G. Wynn-Williams, & D. B. Sanders*. 409, 149, 98-G1 (1993)

- X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai*. 409, 155, 98-G9 (1993)

- High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman*. 409, L5, 104-B1 (1993)

- A Search for Rapid Variability in the Broad H α Profiles of Seyfert and Radio Galaxies. *Michael Eracleous & Jules P. Halpern*. 409, 584, 106-C1 (1993)

- Features of the Fluorescent Iron Line from Highly Inclined Disks: Some Possible Examples for NGC 6814. *G. Bao*. 409, L41, 111-C1 (1993)

- Double-peaked Broad Line Emission from the LINER Nucleus of NGC 1097. *Thaisa Storchi-Bergmann, Jack A. Baldwin, & Andrew S. Wilson.* 410, L11, 117-G1 (1993)
- Near-Infrared Spectroscopy of the Peculiar Giant Elliptical NGC 1275. *Kimiaki Kawara & Yoshiaki Taniguchi.* 410, L19, 117-G13 (1993)
- The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne.* 410, 534, 120-C11 (1993)
- The Circumnuclear Region of NGC 5728. *S. Arribas & E. Mediavilla.* 410, 552, 120-E5 (1993)
- The Ionizing Radiation of Seyfert 2 Galactic Nuclei. *Luis C. Ho, Joseph C. Shields, & Alexei V. Filippenko.* 410, 567, 120-F9 (1993)
- High-Resolution X-Ray Observations of the Central Region of M31 with the ROSAT Satellite. *F. A. Primini, W. Forman, & C. Jones.* 410, 615, 121-C12 (1993)
- HST Observations of NGC 4395, the Least Luminous Seyfert 1 Nucleus: Evidence against the Starburst Hypothesis for Broad-lined Active Galactic Nuclei. *Alexei V. Filippenko, Luis C. Ho, & Wallace L. W. Sargent.* 410, L75, 125-F11 (1993)
- GALAXIES: PHOTOMETRY**
- The Distance to Nearby Galaxy NGC 3109 Based on the Tip of the Red Giant Branch. *Myung Gyoong Lee.* 408, 409, 90-C8 (1993)
- Flow Dynamics and Bending of Wide-Angle Tailed Radio Sources. *Aileen A. O'Donoghue, Jean A. Eilek, & Frazer N. Owen.* 408, 428, 90-E1 (1993)
- Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Siiko, Annamaria K. Siiko, Aneta Siemiginowska, & R. Szczerba.* 409, 139, 98-F5 (1993)
- Infrared Surface Brightness Fluctuations: K'-Band Observations of M31, M32, and the Distance to Maffei 1. *Gerard A. Luppino & John L. Tonry.* 410, 81, 113-B3 (1993)
- Galaxy Colors in Distant Clusters as a Test for the World Model. *Alberto Buzzoni, Guido Chincarini, & Emilio Molinari.* 410, 499, 119-G9 (1993)
- The Shapes of Brightest Cluster Galaxies. *Barbara S. Ryden, Tod R. Lauer, & Marc Postman.* 410, 515, 120-B1 (1993)
- Searching for a Far-Infrared Enhancement in Compact Groups of Galaxies. *Jack W. Sulentic & Duilia F. De Mello Rabaça.* 410, 520, 120-B8 (1993)
- The Interacting System NGC 7753–7752 (Arp 86). I. BVRI Photometry. *Eija Laurikainen, Heikki Salo, & Antonio Aparicio.* 410, 574, 120-G3 (1993)
- GALAXIES: QUASARS: ABSORPTION LINES**
- On the Origin of H I Absorption Systems of Quasars. *Izumi Murakami & Satoru Ikeuchi.* 409, 42, 97-E1 (1993)
- The Galactic Halo and Local Intergalactic Medium toward PKS 2155–304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoichi Kondo.* 409, 199, 99-D6 (1993)
- GALAXIES: QUASARS: EMISSION LINES**
- Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell.* 410, 29, 112-D11 (1993)
- GALAXIES: QUASARS: GENERAL**
- The Hubble Space Telescope Snapshot Survey. IV. A Summary of the Search for Gravitationally Lensed Quasars. *D. Maoz, J. N. Bahcall, D. P. Schneider, N. A. Bahcall, S. Djorgovski, R. Daxey, A. Gould, S. Kirhakos, G. Meylan, & B. Yanny.* 409, 28, 97-D1 (1993)
- Star Trapping and Metallicity Enrichment in Quasars and Active Galactic Nuclei. *Pawel Artymowicz, D. N. C. Lin, & E. Joseph Wampler.* 409, 592, 106-C12 (1993)
- Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell.* 410, 29, 112-D11 (1993)
- Self-absorbed Active Galactic Nuclei and the Cosmic X-Ray Background. *Piero Madau, Gabriele Ghisellini, & A. C. Fabian.* 410, L7, 117-F8 (1993)
- Quasar Clustering on Large Scales. *H. J. Mo & L. Z. Fang.* 410, 493, 119-G1 (1993)
- The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne.* 410, 534, 120-C11 (1993)
- The High-Energy Diffuse Cosmic Gamma-Ray Background Radiation from Blazars. *F. W. Stecker, M. H. Salamon, & M. A. Malkan.* 410, L71, 125-F5 (1993)
- GALAXIES: QUASARS: INDIVIDUAL**
- Name: GQ Comae**
- Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Siiko, Annamaria K. Siiko, Aneta Siemiginowska, & R. Szczerba.* 409, 139, 98-F5 (1993)
- Alphanumeric: 0957+561**
- Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian.* 410, 21, 112-D1 (1993)
- Alphanumeric: 1308+326**
- Is 1308+326 a BL Lacertae Object or a Quasar? *D. C. Gabuzda, R. I. Kollgaard, D. H. Roberts, & J. F. C. Wardle.* 410, 39, 112-E12 (1993)
- Alphanumeric: 1928+738**
- A Massive Binary Black Hole in 1928+738? *Nico Roos, Jelle S. Kaastra, & Christian A. Hummel.* 409, 130, 98-E8 (1993)
- The EGRET Detection of Quasar 1633+382. *J. R. Mattox, D. L. Bertsch, J. Chiang, B. L. Dingus, C. E. Fichtel, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, P. L. Nolan, K. Pinkau, E. Schneid, P. Sreekumar, & D. J. Thompson.* 410, 609, 121-C5 (1993)
- Alphanumeric: PG 1114+445**
- Optical and Hubble Space Telescope Ultraviolet Spectropolarimetry of 3C 273 and PG 1114+445. *Paul S. Smith, Gary D. Schmidt, & Richard G. Allen.* 409, 604, 106-D13 (1993)
- Optical and Hubble Space Telescope Ultraviolet Spectropolarimetry of 3C 273 and PG 1114+445. *Paul S. Smith, Gary D. Schmidt, & Richard G. Allen.* 409, 604, 106-D13 (1993)
- Evidence for a Very Broad Line Region in PG 1138+222. *Paolo Marziani & Jack W. Sulentic.* 409, 612, 106-E10 (1993)
- Alphanumeric: PKS 0528+134**
- Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory. *S. D. Hunter, D. L. Bertsch, B. L. Dingus, C. E. Fichtel, R. C. Hartman, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, P. Möller, C. von Montigny, P. L. Nolan, K. Pinkau, H.-D. Radecke, H. Roethermel, P. Shaver, E. Schneid, M. Sommer, P. Sreekumar, & D. J. Thompson.* 409, 134, 98-E13 (1993)
- GALAXIES: SEYFERT**
- Steps toward Determination of the Size and Structure of the Broad-Line Region in Active Galactic Nuclei. IV. Intensity Variations of the Optical Emission Lines of NGC 5548. *M. Dietrich, W. Kollatschny, B. M. Peterson, J. Bechtold, R. Bertram, N. G. Bochkarev, T. A. Boroson, T. E. Carone, M. Elvis, A. V. Filippenko, C. M. Gaskell, J. P. Huchra, J. B. Hutchings, A. P. Koratkar, K. T. Korista, N. J. Laor, G. M. MacAlpine, M. A. Malkan, C. Mendes de Oliveira, H. Netzer, J. Penfold, M. V. Penston, E. Pérez, R. W. Pogge, M. W. Richmond, E. I. Rosenblatt, A. I. Shapovalova, J. C. Shields, H. A. Smith, P. S. Smith, W.-H. Sun, U. Thiele, S. Veilleux, R. M. Wagner, B. J. Wilkes, B. J. Wills, & D. Wills.* 408, 416, 90-D1 (1993)
- X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai.* 409, 155, 98-G9 (1993)
- High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman.* 409, L5, 104-B1 (1993)
- A Search for Rapid Variability in the Broad H α Profiles of Seyfert and Radio Galaxies. *Michael Eracleous & Jules P. Halpern.* 409, 584, 106-C1 (1993)
- The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston.* 410, 56, 112-G4 (1993)

- Self-absorbed Active Galactic Nuclei and the Cosmic X-Ray Background. *Piero Madau, Gabriele Ghisellini, & A. C. Fabian.* 410, L7, 117-F8 (1993)
- Double-peaked Broad Line Emission from the LINER Nucleus of NGC 1097. *Thaisa Storchi-Bergmann, Jack A. Baldwin, & Andrew S. Wilson.* 410, L11, 117-G1 (1993)
- The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverley J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne.* 410, 534, 120-C11 (1993)
- The Circumnuclear Region of NGC 5728. *S. Aribas & E. Mediavilla.* 410, 552, 120-E5 (1993)
- The Ionizing Radiation of Seyfert 2 Galactic Nuclei. *Luis C. Ho, Joseph C. Shields, & Alexei V. Filippenko.* 410, 567, 120-F9 (1993)
- HST Observations of NGC 4395, the Least Luminous Seyfert 1 Nucleus: Evidence against the Starburst Hypothesis for Broad-lined Active Galactic Nuclei. *Alexei V. Filippenko, Luis C. Ho, & Wallace L. W. Sargent.* 410, L75, 125-F11 (1993)
- GALAXIES: SPIRAL**
- 21 Centimeter Study of Spiral Galaxies in Clusters. III. Neutral Gas Content, Star Formation, and Radio Continuum Properties. *Marco Scodeggio & Giuseppe Gavazzi.* 409, 110, 98-C8 (1993)
- The Circumnuclear Region of NGC 5728. *S. Aribas & E. Mediavilla.* 410, 552, 120-E5 (1993)
- The Interacting System NGC 7753–7752 (Arp 86). II. N-Body Modeling. *Heikki Salo & Eija Laurikainen.* 410, 586, 121-A6 (1993)
- GALAXIES: STARBURST**
- HST Observations of NGC 4395, the Least Luminous Seyfert 1 Nucleus: Evidence against the Starburst Hypothesis for Broad-lined Active Galactic Nuclei. *Alexei V. Filippenko, Luis C. Ho, & Wallace L. W. Sargent.* 410, L75, 125-F11 (1993)
- GALAXIES: STAR CLUSTERS**
- The First Detection of a Collapsed Core Globular Cluster in M31. *O. Bendenelli, C. Cacciari, S. Djorgovski, L. Federici, F. R. Ferraro, F. Fusi Pecci, G. Parmeggiani, N. Weir, & F. Zavatti.* 409, L17, 104-C7 (1993)
- Globular Clusters and cD Formation: The Case of M87. *Dean E. McLaughlin, William E. Harris, & David A. Hanes.* 409, L45, 111-C8 (1993)
- GALAXIES: STELLAR CONTENT**
- The Hot Stellar Component in Elliptical Galaxies and Spiral Bulges. I. The Far-Ultraviolet Spectrum of the Bulge of M31. *Henry C. Ferguson & Arthur F. Davidsen.* 408, 92, 84-C4 (1993)
- 21 Centimeter Study of Spiral Galaxies in Clusters. III. Neutral Gas Content, Star Formation, and Radio Continuum Properties. *Marco Scodeggio & Giuseppe Gavazzi.* 409, 110, 98-C8 (1993)
- Imaging of Fields in the Inner Halo and Outer Disk of M31. *T. J. Davidge.* 409, 190, 99-C8 (1993)
- The Dependence of the Brightness Fluctuation Distance Indicator on Stellar Population Age and Metallicity. *Guy Worthey.* 409, 530, 105-E3 (1993)
- An Optically Luminous Radio Galaxy at $z = 3.22$ and the $K-z$ Diagram at High Redshift. *Stephen A. Eales, Steve Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy.* 409, 578, 106-B7 (1993)
- Star Trapping and Metallicity Enrichment in Quasars and Active Galactic Nuclei. *Pawel Artymowicz, D. N. C. Lin, & E. Joseph Wampler.* 409, 592, 106-C12 (1993)
- Evolution of Elliptical Galaxies. I. The Multiphase Model. *Federico Ferrini & Bianca Maria Poggiani.* 410, 44, 112-F4 (1993)
- The Bulge of M33. *Dante Minniti, Edward W. Olszewski, & Marcia Rieke.* 410, L79, 125-G3 (1993)
- GALAXIES: STRUCTURE**
- Softening in N-Body Simulations of Collisionless Systems. *Charles C. Dyer & Peter S. S. Ip.* 409, 60, 97-F7 (1993)
- Self-consistent Models for Triaxial Galaxies with Flat Rotation Curves: The Disk Case. *Konrad Kuijken.* 409, 68, 97-G1 (1993)
- Structure of Merger Remnants. II. Progenitors with Rotating Bulges. *Lars Hernquist.* 409, 548, 105-F12 (1993)
- Self-consistent Models for Galactic Halos. *Martin Schwarzschild.* 409, 563, 106-A3 (1993)
- The Interacting System NGC 7753–7752 (Arp 86). I. BVRI Photometry. *Eija Laurikainen, Heikki Salo, & Antonio Aparicio.* 410, 574, 120-G3 (1993)
- The Bulge of M33. *Dante Minniti, Edward W. Olszewski, & Marcia Rieke.* 410, L79, 125-G3 (1993)
- GALAXY: CENTER**
- Massive Star Formation near the Galactic Center and the Fate of the Stellar Remnants. *Mark Morris.* 408, 496, 91-D1 (1993)
- An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7–2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 408, 507, 91-E7 (1993)
- VLA Observations of 1E 1740.7–2942: A Search for Radio Recombination Lines of Positronium. *K. R. Anantharamaiah, K. S. Dwarakanath, D. Morris, W. M. Goss, & V. Radhakrishnan.* 410, 110, 113-E1 (1993)
- Highly Blueshifted H I Gas toward the Galactic Center. *Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall.* 410, L27, 118-G12 (1993)
- Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Matthews, R. Wade, & W. D. Duncan.* 410, 650, 121-F11 (1993)
- 4–1–30 E Methanol Emission in G1.6–0.025. *Aubrey D. Haschick & Willem A. Baan.* 410, 663, 121-G12 (1993)
- GALAXY: EVOLUTION**
- The Interstellar $^7\text{Li}/^6\text{Li}$ Isotope Ratio toward ζ Ophiuchi and ζ Persei. *David M. Meyer, Isabel Hawkins, & Edward L. Wright.* 409, L61, 111-E8 (1993)
- GALAXY: FUNDAMENTAL PARAMETERS**
- Unbound Dwarf Spheroidal Galaxies and the Mass of the Milky Way. *Jeffrey R. Kuhn.* 409, L13, 104-C1 (1993)
- GALAXY: GLOBULAR CLUSTERS: GENERAL**
- Low-Mass X-Ray Binaries and Millisecond Pulsars in Globular Clusters. *Kaiyou Chen, John Middleditch, & Malvin Ruderman.* 408, L17, 88-G1 (1993)
- TeV Gamma Rays from Millisecond Pulsars and the Detectability of Globular Clusters. *I. A. Smith.* 408, 468, 91-A7 (1993)
- Canada-France-Hawaii Telescope Observations of Globular Cluster Cores: Blue Straggler Stars in M3 (NGC 5272, GC 1339+286). *Michael Bolte, James E. Hesser, & Peter B. Stetson.* 408, L89, 95-C11 (1993)
- Postcollapse Evolution of Globular Clusters Dominated by Tidal Binary Heating. *Hyung Mok Lee & Jeremiah P. Ostriker.* 409, 617, 106-F3 (1993)
- A Provisional RR Lyrae Distance Scale. *Norman R. Simon & Christine M. Clement.* 410, 526, 120-C1 (1993)
- Nonlocal and Collective Relaxation in Stellar Systems. *Martin D. Weinberg.* 410, 543, 120-D8 (1993)
- GALAXY: GLOBULAR CLUSTERS: INDIVIDUAL**
- Messier Number: M3**
- A Supersoft Variable Low-Luminosity X-Ray Source in the Globular Cluster M3. *P. Hertz, J. E. Grindlay, & C. D. Bailyn.* 410, L87, 126-A1 (1993)
- Messier Number: M79**
- Ultraviolet Properties of Individual Hot Stars in Globular Cluster Cores. I. NGC 1904 (M79). *B. Altner & T. A. Matilsky.* 410, 116, 113-E8 (1993)
- NGC Number: NGC 2031**
- The Age of the Large Magellanic Cloud Cluster NGC 2031. *J. R. Mould, D. A. Xystus, & G. S. Da Costa.* 408, 108, 84-D8 (1993)
- NGC Number: NGC 6397**
- Discovery of Multiple Low-Luminosity X-Ray Sources in NGC 6397. *Adrienne M. Cool, Jonathan E. Grindlay, Martin Krockenberger, & Charles D. Bailyn.* 410, L103, 126-B11 (1993)

GALAXY: HALO

The Galactic Halo and Local Intergalactic Medium toward PKS 2155–304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo.* 409, 199, 99-D6 (1993)

Unbound Dwarf Spheroidal Galaxies and the Mass of the Milky Way. *Jeffrey R. Kuhn.* 409, L13, 104-C1 (1993)

Star Counts Redivivus. I. A New Look at the Galaxy at Faint Magnitudes. *Neill Reid & S. R. Majewski.* 409, 635, 106-G12 (1993)

Disk Plus Halo Models of Gamma-Ray Burst Sources. *I. A. Smith & D. Q. Lamb.* 410, L23, 118-A9 (1993)

GALAXY: KINEMATICS AND DYNAMICS

A Supershell Model for the High- and Intermediate-Velocity Neutral Hydrogen Clouds. *Gerrit L. Verschuur.* 409, 205, 99-D13 (1993)

GALAXY: OPEN CLUSTERS AND ASSOCIATIONS: GENERAL

Far-Ultraviolet Stellar Photometry: A Field in Monoceros. *Edward G. Schmidt & George R. Carruthers.* 408, 484, 91-C1 (1993)

The Evolution of Angular Momentum among Zero-Age Main-Sequence Solar-Type Stars. *David R. Soderblom, John R. Stauffer, Keith B. MacGregor, & Burton F. Jones.* 409, 624, 106-F13 (1993)

Theoretical Models for Massive Stars in Young Magellanic Cloud Stellar Clusters. *Enzo Brocato & Vittorio Castellani.* 410, 99, 113-D1 (1993)

Nonlocal and Collective Relaxation in Stellar Systems. *Martin D. Weinberg.* 410, 543, 120-D8 (1993)

GALAXY: OPEN CLUSTERS AND ASSOCIATIONS: INDIVIDUAL

NGC Number: NGC 2264

Infrared Images of the Young Cluster NGC 2264. *Charles J. Lada, Erick T. Young, & Thomas P. Greene.* 408, 471, 91-A11 (1993)

Name: Hyades

The Hyades Cluster-Supercluster Connection: Evidence for a Local Concentration of Dark Matter. *Stefano Casertano, Icko Iben, Jr., & Aaron Shiels.* 410, 90, 113-C5 (1993)

Name: Pleiades

Interstellar Matter near the Pleiades. IV. The Wake of the Pleiades through the Interstellar Medium in Taurus. *Richard E. White & John Bally.* 409, 234, 99-G13 (1993)

GALAXY: SOLAR NEIGHBORHOOD

Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman.* 408, L41, 89-C1 (1993)

GALAXY: STELLAR CONTENT

Field Color-Magnitude Diagram Analysis along the Bulge Major Axis. *S. Ortolani, E. Bica, & B. Barbuy.* 408, L29, 89-A8 (1993)

GALAXY: STRUCTURE

Field Color-Magnitude Diagram Analysis along the Bulge Major Axis. *S. Ortolani, E. Bica, & B. Barbuy.* 408, L29, 89-A8 (1993)

Star Counts Redivivus. I. A New Look at the Galaxy at Faint Magnitudes. *Neill Reid & S. R. Majewski.* 409, 635, 106-G12 (1993)

Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Matthews, R. Wade, & W. D. Duncan.* 410, 650, 121-F11 (1993)

GAMMA RAYS: BURSTS

Magnetic Field Topology in Pulsars. *Jonathan Arons.* 408, 160, 85-B1 (1993)

Understanding Soft Gamma-Ray Repeaters in the Context of the Extragalactic Radio Pulsar Origin of Gamma-Ray Bursts. *Fulvio Melia & Marco Fatuzzo.* 408, L9, 88-F1 (1993)

Prevalent Properties of Gamma-Ray Burst Variability. *Bennett Link, Richard I. Epstein, & William C. Priedhorsky.* 408, L81, 95-B13 (1993)

Relativistic Electron-Positron Beams in Gamma-Ray Bursters. *I. A. Smith & Richard I. Epstein.* 410, 315, 116-A6 (1993)

Disk Plus Halo Models of Gamma-Ray Burst Sources. *I. A. Smith & D. Q. Lamb.* 410, L23, 118-A9 (1993)

The Signature of the Cosmological Redshift in Population Studies of Gamma-Ray Burst Spectra. *J. J. Brainerd.* 410, 507, 120-A5 (1993)

GAMMA RAYS: OBSERVATIONS

TeV Gamma Rays from Millisecond Pulsars and the Detectability of Globular Clusters. *I. A. Smith.* 408, 468, 91-A7 (1993)

An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7–2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 408, 507, 91-E7 (1993)

Detection of High-Energy Gamma Rays from Quasar PKS 0528+134 by EGRET on the Compton Gamma Ray Observatory. *S. D. Hunter, D. L. Bertsch, B. L. Dingus, C. E. Fichtel, R. C. Hartman, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, P. Möller, C. von Montigny, P. L. Nolan, K. Pinkau, H.-D. Radecke, H. Roethermel, P. Shaver, E. Schneid, M. Sommer, P. Sreekumar, & D. J. Thompson.* 409, 134, 98-E13 (1993)

Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory. *P. L. Nolan, Z. Arzoumanian, D. L. Bertsch, J. Chiang, C. E. Fichtel, J. M. Fierro, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, H. I. Nel, D. Nice, K. Pinkau, H. Roethermel, E. Schneid, M. Sommer, P. Sreekumar, J. H. Taylor, & D. J. Thompson.* 409, 697, 107-F8 (1993)

Evidence for a Spatially Extended Component of Gamma Rays from Solar Flares. *W. Thomas Vestrand & David J. Forrest.* 409, L69, 111-F8 (1993)

Gamma Radiation from Blazar PKS 0537–441. *D. J. Thompson, D. L. Bertsch, C. E. Fichtel, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, P. L. Nolan, K. Pinkau, E. J. Schneid, & P. Sreekumar.* 410, 87, 113-C1 (1993)

VLA Observations of 1E 1740.7–2942: A Search for Radio Recombination Lines of Positronium. *K. R. Anantharamaiah, K. S. Dwarakanath, D. Morris, W. M. Goss, & V. Radhakrishnan.* 410, 110, 113-E1 (1993)

The EGRET Detection of Quasar 1633+382. *J. R. Mattox, D. L. Bertsch, J. Chiang, B. L. Dingus, C. E. Fichtel, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, P. L. Nolan, K. Pinkau, E. Schneid, P. Sreekumar, & D. J. Thompson.* 410, 609, 121-C5 (1993)

GAMMA RAYS: THEORY

η Carinae: A New Model. *J. M. Borgwald & M. W. Friedlander.* 408, 230, 86-A3 (1993)

Diffuse Gamma-Ray Emission from Pulsars in the Large Magellanic Cloud. *Dieter H. Hartmann, Lawrence E. Brown, & Neil Schnepf.* 408, L13, 88-F8 (1993)

TeV Gamma Rays from Millisecond Pulsars and the Detectability of Globular Clusters. *I. A. Smith.* 408, 468, 91-A7 (1993)

Helium Destruction and Gamma-Ray Line Emission in Accreting Neutron Stars. *Lars Bildsten, Edwin E. Salpeter, & Ira Wasserman.* 408, 615, 92-G9 (1993)

Compton Scattering and the Gamma-Ray Power-Law Spectrum in Markarian 421. *Andrzej A. Zdziarski & Julian H. Krolik.* 409, L33, 111-B1 (1993)

High-Frequency Emission of X-Ray Pulsar 1E 2259+586. *V. V. Usov.* 410, 761, 123-C1 (1993)

The High-Energy Diffuse Cosmic Gamma-Ray Background Radiation from Blazars. *F. W. Stecker, M. H. Salamon, & M. A. Malkan.* 410, L71, 125-F5 (1993)

GRAVITATION

Clusters and Groups of Galaxies as Cosmological Probes. *Haruhiko Ueda, Makoto Itoh, & Yasushi Suto.* 408, 3, 83-B5 (1993)

Nonlinear Properties and Time Evolution of Gravitational Galaxy Clustering. *William C. Saslaw & Ravi K. Sheth.* 409, 504, 105-B13 (1993)

Features of the Fluorescent Iron Line from Highly Inclined Disks: Some Possible Examples for NGC 6814. *G. Bao.* 409, L41, 111-C1 (1993)

HYDRODYNAMICS

- A Two-dimensional Relativistic ($\Gamma = 3.25$) Jet Simulation. *Maurice H. P. M. van Putten*. 408, L21, 88-G8 (1993)
- Ionization Effects in Three-dimensional Solar Granulation Simulations. *Mark P. Rast, Åke Nordlund, Robert F. Stein, & Juri Toomre*. 408, L53, 89-D11 (1993)
- Local Hydrodynamic Instability of Rotating Stars. *Alexander Lifschitz & Norman Lebovitz*. 408, 603, 92-F9 (1993)
- The Injection and Acceleration of Particles in Oblique Shocks: A Unified Monte Carlo Description. *Matthew G. Baring, Donald C. Ellison, & Frank C. Jones*. 409, 327, 101-B8 (1993)
- The Formation and Evolution of Shocks in Stellar Jets from a Variable Wind. *Patrick Hartigan & John Raymond*. 409, 705, 107-G5 (1993)
- Two-dimensional Viscous Accretion Disk Models. II. On Viscous Overstability. *W. Kley, J. C. B. Papaloizou, & D. N. C. Lin*. 409, 739, 108-C6 (1993)
- Collapse and Fragmentation of Molecular Cloud Cores. I. Moderately Centrally Condensed Cores. *Alan P. Boss*. 410, 157, 114-B1 (1993)
- Hydrodynamics of Winds from Irradiated Companion Stars in Low-Mass X-Ray Binaries. *Marco Tavani & Richard London*. 410, 281, 115-E8 (1993)
- Three-dimensional Simulations of Protostellar Jets. *Elisabete M. de Gouveia Dal Pino & Willy Benz*. 410, 686, 122-B13 (1993)
- Stellar Core Collapse: A Boltzmann Treatment of Neutrino-Electron Scattering. *Anthony Mezzacappa & Stephen W. Bruenn*. 410, 740, 123-A7 (1993)
- Tidal Disruptions by Supermassive Black Holes: Hydrodynamic Evolution of Stars on a Schwarzschild Background. *Pablo Laguna, Warner A. Miller, Wojciech H. Zurek, & Melvyn B. Davies*. 410, L83, 125-G9 (1993)

HYDROMAGNETICS

- Flux-Tube Divergence, Coronal Heating, and the Solar Wind. *Y.-M. Wang*. 410, L123, 126-D13 (1993)

INFRARED: GALAXIES

- Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Siiko, Annamaria K. Siiko, Aneta Siemiginowska, & R. Szczerba*. 409, 139, 98-F5 (1993)
- Imaging of Luminous Infrared Galaxies at 3.4 Microns. *Shudong Zhou, C. G. Wynn-Williams, & D. B. Sanders*. 409, 149, 98-G1 (1993)
- Molecular Gas in Powerful Radio Galaxies Detected by IRAS. *J. M. Mazzarella, J. R. Graham, D. B. Sanders, & S. Djorgovski*. 409, 170, 99-A13 (1993)
- High-Resolution Mid-Infrared Imaging and Astrometry of the Nucleus of the Seyfert Galaxy NGC 1068. *J. A. Braatz, A. S. Wilson, D. Y. Gezari, F. Varosi, & C. A. Beichman*. 409, L5, 104-B1 (1993)
- Infrared Surface Brightness Fluctuations: K' -Band Observations of M31, M32, and the Distance to Maffei 1. *Gerard A. Luppino & John L. Tonry*. 410, 81, 113-B3 (1993)
- Near-Infrared Spectroscopy of the Peculiar Giant Elliptical NGC 1275. *Kimiaki Kawara & Yoshiaki Taniguchi*. 410, L19, 117-G13 (1993)
- Searching for a Far-Infrared Enhancement in Compact Groups of Galaxies. *Jack W. Sulentic & Duilia F. De Mello Rabaça*. 410, 520, 120-B8 (1993)

INFRARED: GENERAL

- New Excitation Rates and Line Ratios for [Fe II]. *Anil K. Pradhan & Hong Lin Zhang*. 409, L77, 111-G8 (1993)

INFRARED: INTERSTELLAR: CONTINUUM

- Interstellar Extinction in the Infrared: The Molecular Cloud toward HD 62542. *D. C. B. Whittet, P. G. Martin, E. L. Fitzpatrick, & D. Massa*. 408, 573, 92-C11 (1993)
- Photometry and Imaging of the Peculiar Planetary Nebula IRAS 21282+5050. *Sun Kwok, Bruce J. Hrivnak, & Philip P. Langill*. 408, 586, 92-E3 (1993)
- Interstellar Matter near the Pleiades. IV. The Wake of the Pleiades through the Interstellar Medium in Taurus. *Richard E. White & John Bally*. 409, 234, 99-G13 (1993)
- Spatially Resolved Spectra of the Unidentified Infrared Features around HD 44179 (The Red Rectangle). *G. C. Sloan, G. L. Grasdalén, & Paul D. LeVan*. 409, 412, 102-B3 (1993)

INFRARED: INTERSTELLAR: LINES

- H₂ in Interstellar and Extragalactic Ices: Infrared Characteristics, Ultraviolet Production, and Implications. *Scott A. Sandford & Louis J. Allamandola*. 409, L65, 111-F1 (1993)
- The Ratio of Optical-to-Infrared Emission Line Strengths in Ar III as Electron Density Diagnostics for Planetary Nebulae. *F. P. Keenan & E. S. Conlon*. 410, 426, 117-C12 (1993)
- Spectral Imaging of the 3.3 and 11.3 Micron Emission Bands in NGC 1333: Discovery of Spatially Separate Band Emissions. *Jesse Bregman, David Rank, Scott A. Sandford, & Pasquale Temi*. 410, 668, 122-A5 (1993)
- Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude. *J. Bock, V. V. Hristov, M. Kawada, H. Matsuhara, T. Matsumoto, S. Matsuura, P. D. Maukopf, P. L. Richards, M. Tanaka, & A. E. Lange*. 410, L115, 126-D1 (1993)

INFRARED: SOLAR SYSTEM

- Detection of H₃⁺ Infrared Emission Lines in Saturn. *T. R. Geballe, M.-F. Jago, & T. Oka*. 408, L109, 95-F7 (1993)

INFRARED: STARS

- The Spectral Energy Distribution of Star-forming Regions. *Ralf Siebenmorgen*. 408, 218, 85-G3 (1993)
- η Carinae: A New Model. *J. M. Borgwald & M. W. Friedlander*. 408, 230, 86-A3 (1993)
- High-Resolution Mid-Infrared Spectra of Co II, Ni I, and Fe II in SN 1987A. *D. E. Jennings, R. J. Boyle, G. R. Wiedemann, & S. H. Moseley*. 408, 277, 86-E5 (1993)
- Infrared Images of the Young Cluster NGC 2264. *Charles J. Lada, Erick T. Young, & Thomas P. Greene*. 408, 471, 91-A11 (1993)
- Near-Infrared Discovery of the L810 Nebula Illuminator. *João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke*. 408, L101, 95-E9 (1993)
- Circumstellar Shells Resolved in IRAS Survey Data. II. Analysis. *K. Young, T. G. Phillips, & G. R. Knapp*. 409, 725, 108-B3 (1993)
- An Infrared Survey for Embedded Young Stars in the Perseus Molecular Cloud Complex. *E. F. Ladd, E. A. Lada, & P. C. Myers*. 410, 168, 114-C1 (1993)
- Detection of O I and Si II Far-Infrared Fine-Structure Emission from α Orionis. *Michael R. Haas & Alfred E. Glassgold*. 410, L111, 126-C9 (1993)

INSTABILITIES

- Unstable Degenerates Revisited. *John Faulkner*. 408, 600, 92-F5 (1993)
- Local Hydrodynamic Instability of Rotating Stars. *Alexander Lifschitz & Norman Lebovitz*. 408, 603, 92-F9 (1993)
- Two-dimensional Viscous Accretion Disk Models. II. On Viscous Overstability. *W. Kley, J. C. B. Papaloizou, & D. N. C. Lin*. 409, 739, 108-C6 (1993)

INTERGALACTIC MEDIUM

- On the Origin of H I Absorption Systems of Quasars. *Izumi Murakami & Satoru Ikeuchi*. 409, 42, 97-E1 (1993)
- The Galactic Halo and Local Intergalactic Medium toward PKS 2155-304. *Frederick C. Bruhweiler, A. Boggess, Dara J. Norman, C. A. Grady, C. Megan Urry, & Yoji Kondo*. 409, 199, 99-D6 (1993)

INTERPLANETARY MEDIUM

- Magnetic Field Power Density Spectra during "Scatter-free" Solar Particle Events. *L. C. Tan & G. M. Mason*. 409, L29, 104-E1 (1993)

ISM: ABUNDANCES

- Radiative Lifetimes, Branching Ratios, and Absolute Transition Probabilities in Cr II and Zn II. *S. D. Bergeson & J. E. Lawler*. 408, 382, 88-A3 (1993)
- Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman*. 408, L41, 89-C1 (1993)
- ¹²C/¹³C Isotope Ratio in the Local Interstellar Medium from Observations of ¹³C¹⁸O in Molecular Clouds. *William D. Langer & Arno A. Penzias*. 408, 539, 92-A1 (1993)
- Chemical Differentiation between Star-forming Regions: The Orion Hot Core and Compact Ridge. *P. Caselli, T. I. Hasegawa, & Eric Herbst*. 408, 548, 92-A11 (1993)

- Composition of Interstellar Clouds in the Disk and Halo. I. HD 93521. *Lyman Spitzer, Jr., & Edward L. Fitzpatrick.* 409, 299, 100-G3 (1993)
- Neutrino Decay and the Heat Budget of the Warm Interstellar Medium. *D. W. Sciama.* 409, L25, 104-D9 (1993)
- The Interstellar $^7\text{Li}/^6\text{Li}$ Isotope Ratio toward ζ Ophiuchi and ζ Persei. *David M. Meyer, Isabel Hawkins, & Edward L. Wright.* 409, L61, 111-E8 (1993)
- The Nature of the Molecular Cores in High-Latitude Cirrus Clouds. IV. The Electron Distribution and the Abundance and Chemistry of H_2CO . *B. E. Turner.* 410, 140, 113-G8 (1993)
- The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupois, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine.* 410, L119, 126-D7 (1993)
- ISM: ATOMS**
- Highly Blueshifted H I Gas toward the Galactic Center. *Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall.* 410, L27, 118-G12 (1993)
- ISM: BUBBLES**
- Magnetic Diffusion Due to Supernova Explosions and Superbubbles in the Galactic Disk. *Katia Ferrière.* 409, 248, 100-C1 (1993)
- Large-Scale Explosions and Superbubbles in the Galactic Disk and Halo. I. Magnetohydrodynamic Simulations. *Shin Mineshige, Kazunari Shibata, & Paul R. Shapiro.* 409, 663, 107-C1 (1993)
- ISM: CLOUDS**
- $^{12}\text{C}/^{13}\text{C}$ Isotope Ratio in the Local Interstellar Medium from Observations of $^{13}\text{C}^{18}\text{O}$ in Molecular Clouds. *William D. Langer & Arno A. Penzias.* 408, 539, 92-A1 (1993)
- CH as a Tracer of a Translucent Cloud Boundary. *Loris Magnani & Joseph S. Onello.* 408, 559, 92-B9 (1993)
- Interstellar Extinction in the Infrared: The Molecular Cloud toward HD 62542. *D. C. B. Whittet, P. G. Martin, E. L. Fitzpatrick, & D. Massa.* 408, 573, 92-C11 (1993)
- A Supershell Model for the High- and Intermediate-Velocity Neutral Hydrogen Clouds. *Gerrit L. Verschuur.* 409, 205, 99-D13 (1993)
- The X-Ray Shadow of the High-Latitude Molecular Cloud MBM 12. *S. L. Snowden, D. McCammon, & F. Verter.* 409, L21, 104-D1 (1993)
- Modeling the Structure of H I in the Galactic Disk. *Joel N. Bregman, Daniel D. Kelson, & Gregory A. Ashe.* 409, 682, 107-D9 (1993)
- The Nature of the Molecular Cores in High-Latitude Cirrus Clouds. IV. The Electron Distribution and the Abundance and Chemistry of H_2CO . *B. E. Turner.* 410, 140, 113-G8 (1993)
- Collapse and Fragmentation of Molecular Cloud Cores. I. Moderately Centrally Condensed Cores. *Alan P. Boss.* 410, 157, 114-B1 (1993)
- An Infrared Survey for Embedded Young Stars in the Perseus Molecular Cloud Complex. *E. F. Ladd, E. A. Lada, & P. C. Myers.* 410, 168, 114-C1 (1993)
- Observation of [C II] 158 Micron Emission from the Diffuse Interstellar Medium at High Galactic Latitude. *J. Bock, V. V. Hristov, M. Kawada, H. Matsuhara, T. Matsumoto, S. Matsuura, P. D. Maukopf, P. L. Richards, M. Tanaka, & A. E. Lange.* 410, L115, 126-D1 (1993)
- ISM: COSMIC RAYS**
- η Carinae: A New Model. *J. M. Borgwald & M. W. Friedlander.* 408, 230, 86-A3 (1993)
- Magnetic Field Power Density Spectra during "Scatter-free" Solar Particle Events. *L. C. Tan & G. M. Mason.* 409, L29, 104-E1 (1993)
- Solar Neutron and Proton Production during the 1990 May 24 Cosmic-Ray Flare Increases. *H. Debrunner, J. A. Lockwood, & J. M. Ryan.* 409, 822, 109-D1 (1993)
- ISM: DUST, EXTINCTION**
- The Spectral Energy Distribution of Star-forming Regions. *Ralf Siebenmorgen.* 408, 218, 85-G3 (1993)
- Theoretical Infrared Spectra of Some Model Polycyclic Aromatic Hydrocarbons: Effect of Ionization. *D. J. De Frees, M. D. Miller, D. Talbi, F. Pauzat, & Y. Ellinger.* 408, 530, 91-G5 (1993)
- Interstellar Extinction in the Infrared: The Molecular Cloud toward HD 62542. *D. C. B. Whittet, P. G. Martin, E. L. Fitzpatrick, & D. Massa.* 408, 573, 92-C11 (1993)
- Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance.* 408, L97, 95-E3 (1993)
- Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Sitko, Annamaria K. Sitko, Aneta Siemiginowska, & R. Szczerba.* 409, 139, 98-F5 (1993)
- Ice Grains in the Corona Australis Molecular Cloud. *W. P. Chen & J. A. Graham.* 409, 319, 101-A11 (1993)
- An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright.* 409, 404, 102-A8 (1993)
- The Nature of the Molecular Cores in High-Latitude Cirrus Clouds. IV. The Electron Distribution and the Abundance and Chemistry of H_2CO . *B. E. Turner.* 410, 140, 113-G8 (1993)
- Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Matthews, R. Wade, & W. D. Duncan.* 410, 650, 121-F11 (1993)
- The Dynamics of Stellar Outflows Dominated by Interaction of Dust and Radiation. *Nathan Netzer & Moshe Elitzur.* 410, 701, 122-D11 (1993)
- Voyager 2 Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murthy, A. Dring, & R. C. Henry.* 410, 714, 122-E13 (1993)
- Laboratory Spectra of Polycyclic Aromatic Hydrocarbon Ions and the Interstellar Extinction Curve. *Wei Lee & Thomas J. Wdowiak.* 410, L127, 126-E5 (1993)
- ISM: GENERAL**
- The X-Ray Shadow of the High-Latitude Molecular Cloud MBM 12. *S. L. Snowden, D. McCammon, & F. Verter.* 409, L21, 104-D1 (1993)
- Discontinuities in the Dynamic Spectrum of the Pulsar 0823+26. *Andrew W. Clegg, Ralph L. Fiedler, & James M. Cordes.* 409, 691, 107-E13 (1993)
- On the Origin of the Soft X-Ray Background. *Q. Daniel Wang & Richard McCray.* 409, L37, 111-B8 (1993)
- ISM: H II REGIONS**
- Motion in the Orion Nebula: A Kinematic Study of [S III]. *Zheng Wen & C. R. O'Dell.* 409, 262, 100-D1 (1993)
- Further Studies on the Champagne Phase of GM 24 (IRAS 17136-3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho.* 409, 269, 100-D10 (1993)
- From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. *José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó.* 410, 202, 114-F1 (1993)
- New 325 MHz Observations of H II Galaxies: The Mechanisms That Shape the Unusual Radio Spectra. *Hans-Jörg Deeg, Elias Brinks, Neb Duric, Uli Klein, & Evan Skillman.* 410, 626, 121-D13 (1993)
- Discovery of New Objects in the Orion Nebula on HST Images: Shocks, Compact Sources, and Protoplanetary Disks. *C. R. O'Dell, Zheng Wen, & Xihai Hu.* 410, 696, 122-C11 (1993)
- ISM: INDIVIDUAL**
- Messier Number: M42**
- Motion in the Orion Nebula: A Kinematic Study of [S III]. *Zheng Wen & C. R. O'Dell.* 409, 262, 100-D1 (1993)
- Name: Barnard 5**
- Hierarchical Structure Analysis of Interstellar Clouds Using Nonorthogonal Wavelets. *William D. Langer, Robert W. Wilson, & Charles H. Anderson.* 408, L45, 89-C7 (1993)
- Name: Cepheus A**
- From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. *José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó.* 410, 202, 114-F1 (1993)
- Name: Corona Australis Cloud**
- Ice Grains in the Corona Australis Molecular Cloud. *W. P. Chen & J. A. Graham.* 409, 319, 101-A11 (1993)

Name: Crab Nebula

Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory. P. L. Nolan, Z. Arzoumanian, D. L. Bertsch, J. Chiang, C. E. Fichtel, J. M. Fierro, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, H. I. Nel, D. Nice, K. Pinkau, H. Rothermel, E. Schneid, M. Sommer, P. Sreekumar, J. H. Taylor, & D. J. Thompson. 409, 697, 107-F8 (1993)

Name: 30 Doradus

A New Luminous Blue Variable: R143 in 30 Doradus. Joel Wm. Parker, Geoffrey C. Clayton, Cláudia Winge, & Peter S. Conti. 409, 770, 108-F3 (1993)

Name: Orion Nebula

Motion in the Orion Nebula: A Kinematic Study of [S III]. Zheng Wen & C. R. O'Dell. 409, 262, 100-D1 (1993)

The Physical Structure of Orion-KL on 2500 AU Scales Using the K-Doublet Transitions of Formaldehyde. Jeffrey G. Mangum, Alwyn Wootten, & Richard L. Plambeck. 409, 282, 100-E13 (1993)

Extended CO(7-6) Emission from Warm Gas in Orion. J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey. 410, 179, 114-D1 (1993)

Discovery of New Objects in the Orion Nebula on HST Images: Shocks, Compact Sources, and Protoplanetary Disks. C. R. O'Dell, Zheng Wen, & Xihai Hu. 410, 696, 122-C11 (1993)

Name: Red Rectangle

Spatially Resolved Spectra of the Unidentified Infrared Features around HD 44179 (The Red Rectangle). G. C. Sloan, G. L. Grasdalen, & Paul D. LeVan. 409, 412, 102-B3 (1993)

Name: Sagittarius A East

Highly Blueshifted H I Gas toward the Galactic Center. Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall. 410, L27, 118-G12 (1993)

Name: Sagittarius A West

Highly Blueshifted H I Gas toward the Galactic Center. Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall. 410, L27, 118-G12 (1993)

NGC Number: NGC 1333

Spectral Imaging of the 3.3 and 11.3 Micron Emission Bands in NGC 1333: Discovery of Spatially Separate Band Emissions. Jesse Bregman, David Rank, Scott A. Sandford, & Pasquale Temi. 410, 668, 122-A5 (1993)

NGC Number: NGC 2024

A Flattened Cloud Core in NGC 2024. Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó. 408, 565, 92-C1 (1993)

NGC Number: NGC 7023

Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance. 408, L97, 95-E3 (1993)

Voyager 2 Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murthy, A. Dring, & R. C. Henry. 410, 714, 122-E13 (1993)

Alphanumeric: G1.6-0.025

4-1-30 E Methanol Emission in G1.6-0.025. Aubrey D. Haschick & Willem A. Baan. 410, 663, 121-G12 (1993)

Alphanumeric: G39.2-0.3

Spatial Spectral Index Variations in Galactic Shell Supernova Remnants G39.2-0.3 and G41.1-0.3. Martha C. Anderson & Lawrence Rudnick. 408, 514, 91-E9 (1993)

Alphanumeric: G41.1-0.3

Spatial Spectral Index Variations in Galactic Shell Supernova Remnants G39.2-0.3 and G41.1-0.3. Martha C. Anderson & Lawrence Rudnick. 408, 514, 91-E9 (1993)

Alphanumeric: GM 24

Further Studies on the Champagne Phase of GM 24 (IRAS 17136-3617). J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho. 409, 269, 100-D10 (1993)

Alphanumeric: HH 1-2

A New Herbig-Haro Flow in the HH 1-2 Complex. Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga. 408, L49, 89-D1 (1993)

Alphanumeric: HH 144

A New Herbig-Haro Flow in the HH 1-2 Complex. Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga. 408, L49, 89-D1 (1993)

Alphanumeric: HH 145

A New Herbig-Haro Flow in the HH 1-2 Complex. Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga. 408, L49, 89-D1 (1993)

Alphanumeric: IC 2220

An Infrared Study of the Remarkable Dusty M Star HR 3126. J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright. 409, 404, 102-A8 (1993)

Alphanumeric: IRS 16

Highly Blueshifted H I Gas toward the Galactic Center. Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall. 410, L27, 118-G12 (1993)

Alphanumeric: L810

Near-Infrared Discovery of the L810 Nebula Illuminator. João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke. 408, L101, 95-E9 (1993)

Alphanumeric: L1551 IRS 5

Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. M. Barsony, N. Z. Scoville, & C. J. Chandler. 409, 275, 100-E4 (1993)

Alphanumeric: MBM 16

CH as a Tracer of a Translucent Cloud Boundary. Loris Magnani & Joseph S. Onello. 408, 559, 92-B9 (1993)

Alphanumeric: OH 231.8+4.2

Radio and X-Ray Observations of OH 231.8+4.2. Gregory B. Taylor & Mark Morris. 409, 720, 108-A9 (1993)

Alphanumeric: W28

A Young, Glitching Pulsar near the Direction of W28. V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar. 409, L57, 111-E1 (1993)

ISM: JETS AND OUTFLOWS

Centrifugally Driven Winds from Protostellar Disks. I. Wind Model and Thermal Structure. Pedro N. Safer. 408, 115, 84-E6 (1993)

Centrifugally Driven Winds from Protostellar Disks. II. Forbidden-Line Emission in T Tauri Stars. Pedro N. Safer. 408, 148, 85-A1 (1993)

A New Herbig-Haro Flow in the HH 1-2 Complex. Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga. 408, L49, 89-D1 (1993)

A Flattened Cloud Core in NGC 2024. Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó. 408, 565, 92-C1 (1993)

Near-Infrared Discovery of the L810 Nebula Illuminator. João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke. 408, L101, 95-E9 (1993)

Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. M. Barsony, N. Z. Scoville, & C. J. Chandler. 409, 275, 100-E4 (1993)

The Formation and Evolution of Shocks in Stellar Jets from a Variable Wind. Patrick Hartigan & John Raymond. 409, 705, 107-G5 (1993)

From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó. 410, 202, 114-F1 (1993)

The Structure of Protostellar Accretion Disks and the Origin of Bipolar Flows. Mark Wardle & Arieh Königl. 410, 218, 114-G6 (1993)

High-Resolution Long-Slit Spectral Imaging of the Mass Outflows in the Immediate Vicinity of DG Tauri. J. Solf & K. H. Böhm. 410, L31, 118-F13 (1993)

Three-dimensional Simulations of Protostellar Jets. Elisabete M. de Gouveia Dal Pino & Willy Benz. 410, 686, 122-B13 (1993)

- Discovery of New Objects in the Orion Nebula on *HST* Images: Shocks, Compact Sources, and Protoplanetary Disks. *C. R. O'Dell, Zheng Wen, & Xihai Hu.* 410, 696, 122-C11 (1993)
- The Dynamics of Stellar Outflows Dominated by Interaction of Dust and Radiation. *Nathan Netzer & Moshe Elitzur.* 410, 701, 122-D11 (1993)
- ISM: KINEMATICS AND DYNAMICS**
- Circumstellar Molecular Gas of the HH 34 and HH 111 Exciting Stars. *Karl R. Stapelfeldt & Nicholas Z. Scoville.* 408, 239, 86-B1 (1993)
- Motion in the Orion Nebula: A Kinematic Study of [S III]. *Zheng Wen & C. R. O'Dell.* 409, 262, 100-D1 (1993)
- The Hyades Cluster-Supercluster Connection: Evidence for a Local Concentration of Dark Matter. *Stefano Casertano, Icko Iben, Jr., & Aaron Shiels.* 410, 90, 113-C5 (1993)
- Extended CO(7→6) Emission from Warm Gas in Orion. *J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey.* 410, 179, 114-D1 (1993)
- Highly Blueshifted H I Gas toward the Galactic Center. *Farhad Yusef-Zadeh, Anthony Lasenby, & Jennifer Marshall.* 410, L27, 118-G12 (1993)
- ISM: MAGNETIC FIELDS**
- Models for the Magnetic Field of M81. *David Moss, Axel Brandenburg, Karl Johan Donner, & Magnus Thomasson.* 409, 179, 99-B10 (1993)
- Large-Scale Explosions and Superbubbles in the Galactic Disk and Halo. I. Magnetohydrodynamic Simulations. *Shin Mineshige, Kazunari Shibata, & Paul R. Shapiro.* 409, 663, 107-C1 (1993)
- A Similarity Solution to the Kinematic $\alpha^2\omega$ Dynamo Equation with Time-dependent Coefficients. *Chung-Ming Ko.* 410, 128, 113-F8 (1993)
- ISM: MOLECULES**
- Hierarchical Structure Analysis of Interstellar Clouds Using Nonorthogonal Wavelets. *William D. Langer, Robert W. Wilson, & Charles H. Anderson.* 408, L45, 89-C7 (1993)
- Rotational Spectra of the $X^2\Sigma^+$ States of CaH and CaD. *C. I. Frum, J. J. Oh, E. A. Cohen, & H. M. Pickett.* 408, L61, 89-F1 (1993)
- The Millimeter-Wave Spectrum of CaH ($X^2\Sigma^+$). *W. L. Barclay, Jr., M. A. Anderson, & L. M. Ziurys.* 408, L65, 89-F8 (1993)
- Theoretical Infrared Spectra of Some Model Polycyclic Aromatic Hydrocarbons: Effect of Ionization. *D. J. De Fries, M. D. Miller, D. Talbi, F. Pauzat, & Y. Ellinger.* 408, 530, 91-G5 (1993)
- $^{12}\text{C}/^{13}\text{C}$ Isotope Ratio in the Local Interstellar Medium from Observations of $^{13}\text{C}^{18}\text{O}$ in Molecular Clouds. *William D. Langer & Arno A. Penzias.* 408, 539, 92-A1 (1993)
- Chemical Differentiation between Star-forming Regions: The Orion Hot Core and Compact Ridge. *P. Caselli, T. I. Hasegawa, & Eric Herbst.* 408, 548, 92-A11 (1993)
- CH as a Tracer of a Translucent Cloud Boundary. *Loris Magnani & Joseph S. Onello.* 408, 559, 92-B9 (1993)
- A Flattened Cloud Core in NGC 2024. *Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó.* 408, 565, 92-C1 (1993)
- H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith.* 408, L105, 95-F1 (1993)
- Laboratory Detection of a New Free Radical C₄S ($^3\Sigma^-$). *Yasuhiro Hirahara, Yasuhiro Ohshima, & Yasuki Endo.* 408, L113, 95-F13 (1993)
- Molecular Gas in Powerful Radio Galaxies Detected by IRAS. *J. M. Mazzarella, J. R. Graham, D. B. Sanders, & S. Djorgovski.* 409, 170, 99-A13 (1993)
- The Physical Structure of Orion-KL on 2500 AU Scales Using the K-Doublet Transitions of Formaldehyde. *Jeffrey G. Mangum, Alwyn Wootten, & Richard L. Plambeck.* 409, 282, 100-E13 (1993)
- H₂ in Interstellar and Extragalactic Ices: Infrared Characteristics, Ultraviolet Production, and Implications. *Scott A. Sandford & Louis J. Allamandola.* 409, L65, 111-F1 (1993)
- Density Wave Kinematics and Giant Molecular Association Formation in M51. *Richard J. Rand.* 410, 68, 113-A3 (1993)
- The Nature of the Molecular Cores in High-Latitude Cirrus Clouds. IV. The Electron Distribution and the Abundance and Chemistry of H₂CO. *B. E. Turner.* 410, 140, 113-G8 (1993)
- Collapse and Fragmentation of Molecular Cloud Cores. I. Moderately Centrally Condensed Cores. *Alan P. Boss.* 410, 157, 114-B1 (1993)
- Extended CO(7→6) Emission from Warm Gas in Orion. *J. E. Howe, D. T. Jaffe, E. N. Grossman, W. F. Wall, J. G. Mangum, & G. J. Stacey.* 410, 179, 114-D1 (1993)
- The Formation of Cyanopolyne Molecules in IRC +10216. *Isabelle Cherchneff, Alfred E. Glassgold, & Gary A. Mamon.* 410, 188, 114-D12 (1993)
- From Bipolar to Quadrupolar: The Collimation Processes of the Cepheus A Outflow. *José M. Torrelles, Lourdes Verdes-Montenegro, Paul T. P. Ho, Luis F. Rodríguez, & Jorge Cantó.* 410, 202, 114-F1 (1993)
- Detection of CO Emission from Massive Molecular Clouds in the Inner Disk of M31. *Ronald J. Allen & J. Lequeux.* 410, L15, 117-G7 (1993)
- An Ab Initio Prediction of the Spectroscopic Constants of MgNC: The First Mg-bearing Molecule in Space. *Keisaku Ishii, Tsuneo Hirano, Umpei Nagashima, Bernhard Weis, & Koichi Yamashita.* 410, L43, 118-D7 (1993)
- Laboratory Detection of C₂S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Obi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami.* 410, L45, 118-D11 (1993)
- Laboratory Measurements of the Millimeter-Wave Spectra of Calcium Isocyanide. *Timothy C. Steimle, Shuji Saito, & Shuro Takano.* 410, L49, 118-C2 (1993)
- Laboratory Submillimeter-Wave Observation of the $N = 1-0$ Transition of the ND($^3\Sigma^-$) Radical. *Shuji Saito & Masahiro Goto.* 410, L53, 118-C7 (1993)
- Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Matthews, R. Wade, & W. D. Duncan.* 410, 650, 121-F11 (1993)
- 4₋₁-3₀ E Methanol Emission in G1.6-0.025. *Aubrey D. Haschick & Willem A. Baan.* 410, 663, 121-G12 (1993)
- Spectral Imaging of the 3.3 and 11.3 Micron Emission Bands in NGC 1333: Discovery of Spatially Separate Band Emissions. *Jesse Bregman, David Rank, Scott A. Sandford, & Pasquale Temi.* 410, 668, 122-A5 (1993)
- Laboratory Spectra of Polycyclic Aromatic Hydrocarbon Ions and the Interstellar Extinction Curve. *Wei Lee & Thomas J. Wdowiak.* 410, L127, 126-E5 (1993)
- ISM: PLANETARY NEBULAE: GENERAL**
- H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith.* 408, L105, 95-F1 (1993)
- Circumstellar Shells Resolved in IRAS Survey Data. II. Analysis. *K. Young, T. G. Phillips, & G. R. Knapp.* 409, 725, 108-B3 (1993)
- On the Distance to Galactic Planetary Nebulae. *C. Y. Zhang.* 410, 239, 115-B1 (1993)
- Search for Ionized Cores in Proto-Planetary Nebulae, and the Asymptotic Giant Branch to Planetary Nebula Transition. *Hans Ulrich Käufel, Alvio Renzini, & Letizia Stanghellini.* 410, 251, 115-C1 (1993)
- The Ratio of Optical-to-Infrared Emission Line Strengths in Ar III as Electron Density Diagnostics for Planetary Nebulae. *F. P. Keenan & E. S. Conlon.* 410, 426, 117-C12 (1993)
- ISM: PLANETARY NEBULAE: INDIVIDUAL**
- NGC Number: NGC 2438**
- Radio and X-Ray Observations of OH 231.8+4.2. *Gregory B. Taylor & Mark Morris.* 409, 720, 108-A9 (1993)
- NGC Number: NGC 7027**
- H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith.* 408, L105, 95-F1 (1993)
- Alphanumeric: BD +30°3639**
- H₂ Morphology of Young Planetary Nebulae. *James R. Graham, T. M. Herbst, K. Matthews, G. Neugebauer, B. T. Soifer, E. Serabyn, & S. Beckwith.* 408, L105, 95-F1 (1993)

Alphanumeric: IC 4593

The Morphology and Interaction with the Interstellar Medium of the Planetary Nebula IC 4593. *Daniel B. Zucker & Noam Soker*. 408, 579, 92-D5 (1993)

Alphanumeric: IC 4997

Fe III Emission Lines in the Optical Spectrum of the Planetary Nebula IC 4997. *F. P. Keenan, L. H. Aller, S. Hyung, E. S. Conlon, & G. A. Warren*. 410, 430, 117-D3 (1993)

Alphanumeric: IRAS 21282+5050

Photometry and Imaging of the Peculiar Planetary Nebula IRAS 21282+5050. *Sun Kwok, Bruce J. Hrivnak, & Philip P. Langill*. 408, 586, 92-E3 (1993)

Alphanumeric: LSIV -12°111

LSIV -12°111: A Candidate Halo Proto-Planetary Nebula. *E. S. Conlon, P. L. Dufton, R. J. H. McCausland, & F. P. Keenan*. 408, 593, 92-E11 (1993)

ISM: REFLECTION NEBULAE

Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance*. 408, L97, 95-E3 (1993)

Near-Infrared Discovery of the L810 Nebula Illuminator. *João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke*. 408, L101, 95-E9 (1993)

An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright*. 409, 404, 102-A8 (1993)

Voyager 2 Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murthy, A. Dring, & R. C. Henry*. 410, 714, 122-E13 (1993)

ISM: STRUCTURE

The Morphology and Interaction with the Interstellar Medium of the Planetary Nebula IC 4593. *Daniel B. Zucker & Noam Soker*. 408, 579, 92-D5 (1993)

Interstellar Matter near the Pleiades. IV. The Wake of the Pleiades through the Interstellar Medium in Taurus. *Richard E. White & John Bally*. 409, 234, 99-G13 (1993)

Motion in the Orion Nebula: A Kinematic Study of [S III]. *Zheng Wen & C. R. O'Dell*. 409, 262, 100-D1 (1993)

Modeling the Structure of H I in the Galactic Disk. *Joel N. Bregman, Daniel D. Kelson, & Gregory A. Ashe*. 409, 682, 107-D9 (1993)

Angular Broadening of Pulsars and the Distribution of Interstellar Plasma Fluctuations. *C. R. Gwinn, N. Bartel, & J. M. Cordes*. 410, 673, 122-A13 (1993)

The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupuis, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine*. 410, L119, 126-D7 (1993)

ISM: SUPERNOVA REMNANTS

The Freeze-out Phase of SN 1987A: Implications for the Light Curve. *Claes Fransson & Cecilia Kozma*. 408, L25, 89-A1 (1993)

Spatial Spectral Index Variations in Galactic Shell Supernova Remnants G39.2-0.3 and G41.1-0.3. *Martha C. Anderson & Lawrence Rudnick*. 408, 514, 91-E9 (1993)

Deep VLA Imaging of Pulsar-powered Nebulae and the Beaming Fraction of Young Pulsars. *Dale A. Frail & David A. Moffett*. 408, 637, 93-B5 (1993)

Star Trapping and Metallicity Enrichment in Quasars and Active Galactic Nuclei. *Paweł Artymowicz, D. N. C. Lin, & E. Joseph Wampler*. 409, 592, 106-C12 (1993)

Large-Scale Explosions and Superbubbles in the Galactic Disk and Halo. I. Magnetohydrodynamic Simulations. *Shin Mineshige, Kazunari Shibata, & Paul R. Shapiro*. 409, 663, 107-C1 (1993)

Modeling the Structure of H I in the Galactic Disk. *Joel N. Bregman, Daniel D. Kelson, & Gregory A. Ashe*. 409, 682, 107-D9 (1993)

A Young, Glitching Pulsar near the Direction of W28. *V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar*. 409, L57, 111-E1 (1993)

Angular Broadening of Pulsars and the Distribution of Interstellar Plasma Fluctuations. *C. R. Gwinn, N. Bartel, & J. M. Cordes*. 410, 673, 122-A13 (1993)

LINE: FORMATION

Centrifugally Driven Winds from Protostellar Disks. II. Forbidden-Line Emission in T Tauri Stars. *Pedro N. Safer*. 408, 148, 85-A1 (1993)

An Implicit Integral Method to Solve Selected Radiative Transfer Problems. I. Non-LTE Line Formation. *E. Simonneau & L. Crivellari*. 409, 830, 109-D12 (1993)

LINE: IDENTIFICATION

The Millimeter-Wave Spectrum of CaH ($X^2\Sigma^+$). *W. L. Barclay, Jr., M. A. Anderson, & L. M. Ziurys*. 408, L65, 89-F8 (1993)

Laboratory Detection of a New Free Radical C₄S ($^3\Sigma^-$). *Yasuhiro Hirahara, Yasuhiro Ohshima, & Yasuki Endo*. 408, L113, 95-F13 (1993)

On the Carrier of the Band at 700 Nanometers in the Iron Hydride Spectrum. *John G. Phillips & Sumner P. Davis*. 409, 860, 109-G9 (1993)

Laboratory Detection of C₂S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Obi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentaro Kawaguchi, & Akinori Murakami*. 410, L45, 118-D11 (1993)

Laboratory Measurements of the Millimeter-Wave Spectra of Calcium Isocyanide. *Timothy C. Steimle, Shuji Saito, & Shuro Takano*. 410, L49, 118-C2 (1993)

LINE: PROFILES

Centrifugally Driven Winds from Protostellar Disks. II. Forbidden-Line Emission in T Tauri Stars. *Pedro N. Safer*. 408, 148, 85-A1 (1993)

Dynamic Processes in Be Star Atmospheres. I. "Dimple" Formation in the He sci $\lambda 6678$ Line of λ Eridani. *Myron A. Smith & Ronald S. Polidan*. 408, 323, 87-B8 (1993)

A Search for Rapid Variability in the Broad H α Profiles of Seyfert and Radio Galaxies. *Michael Eracleous & Jules P. Halpern*. 409, 584, 106-C1 (1993)

Evidence for a Very Broad Line Region in PG 1138+222. *Paolo Marziani & Jack W. Sulentic*. 409, 612, 106-E10 (1993)

Chromospheric Heating by Acoustic Shocks: A Confrontation of GHRS Observations of α Tauri (K5 III) with Ab Initio Calculations. *P. G. Judge & M. Cuntz*. 409, 776, 108-F13 (1993)

Features of the Fluorescent Iron Line from Highly Inclined Disks: Some Possible Examples for NGC 6814. *G. Bao*. 409, L41, 111-C1 (1993)

The Peculiar Balmer Line Profiles of OQ 208. *P. Marziani, J. W. Sulentic, M. Calvani, E. Perez, M. Moles, & M. V. Penston*. 410, 56, 112-G4 (1993)

Double-peaked Broad Line Emission from the LINER Nucleus of NGC 1097. *Thaisa Storchi-Bergmann, Jack A. Baldwin, & Andrew S. Wilson*. 410, L11, 117-G1 (1993)

Ultraviolet Line Diagnostics of Accretion Disk Winds in Cataclysmic Variables. *Peter Vitello & Isaac Shlosman*. 410, 815, 123-G11 (1993)

Asymmetries of Solar Oscillation Line Profiles. *T. L. Duvall, Jr., S. M. Jefferies, J. W. Harvey, Y. Osaki, & M. A. Pomerantz*. 410, 829, 124-A13 (1993)

MAGNETIC FIELDS

Understanding Soft Gamma-Ray Repeaters in the Context of the Extragalactic Radio Pulsar Origin of Gamma-Ray Bursts. *Fulvio Melia & Marco Fatuzzo*. 408, L9, 88-F1 (1993)

Models for the Magnetic Field of M81. *David Moss, Axel Brandenburg, Karl Johan Donner, & Magnus Thomasson*. 409, 179, 99-B10 (1993)

Magnetic Field Power Density Spectra during "Scatter-free" Solar Particle Events. *L. C. Tan & G. M. Mason*. 409, L29, 104-E1 (1993)

The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. *V. Pirola, P. Hakala, & G. V. Coyne, S.J.* 410, L107, 126-C3 (1993)

MAGNETOHYDRODYNAMICS: MHD

Centrifugally Driven Winds from Protostellar Disks. I. Wind Model and Thermal Structure. *Pedro N. Safer*. 408, 115, 84-E6 (1993)

Centrifugally Driven Winds from Protostellar Disks. II. Forbidden-Line Emission in T Tauri Stars. *Pedro N. Safer*. 408, 148, 85-A1 (1993)

Magnetic Field Decay from the Core of Neutron Stars: Effects of Interpinning of 3P_2 Neutron Superfluid and 1S_0 Proton

- Superconducting Fluid. *K. Y. Ding, K. S. Cheng, & H. F. Chau.* 408, 167, 85-B11 (1993)
- Neutron Star Dynamos and the Origins of Pulsar Magnetism. *Christopher Thompson & Robert C. Duncan.* 408, 194, 85-E4 (1993)
- On the Thermal Stability of a Radiating Plasma Subject to Nonlocal Thermal Conduction. I. Linear Analysis. *E. Chun & R. Rosner.* 408, 678, 93-F1 (1993)
- Three-dimensional Structures of Magnetostatic Atmospheres. V. Coupled Electric Current Systems. *B. C. Low.* 408, 689, 93-G1 (1993)
- Three-dimensional Structures of Magnetostatic Atmospheres. VI. Examples of Coupled Electric Current Systems. *B. C. Low.* 408, 693, 93-G7 (1993)
- A Solar Dynamo Surface Wave at the Interface between Convection and Nonuniform Rotation. *E. N. Parker.* 408, 707, 94-A9 (1993)
- Models for the Magnetic Field of M81. *David Moss, Axel Brandenburg, Karl Johan Donner, & Magnus Thomasson.* 409, 179, 99-B10 (1993)
- Magnetic Diffusion Due to Supernova Explosions and Superbubbles in the Galactic Disk. *Katia Ferriere.* 409, 248, 100-C1 (1993)
- Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. *M. Barsony, N. Z. Scoville, & C. J. Chandler.* 409, 275, 100-E4 (1993)
- Particle Dynamics in Spherical Wave Fields of Rotating Magnets: Acceleration Boundary, Plasma Border, and $1/r^2$ Law of Asymptotic Energy. *K. O. Thielheim.* 409, 333, 101-C1 (1993)
- The Cutoff Frequency for Fast-Mode Magnetohydrodynamic Waves in an Isothermal Atmosphere with a Uniform Horizontal Magnetic Field. *B. A. Stark & Z. E. Musielak.* 409, 450, 102-E5 (1993)
- Large-Scale Explosions and Superbubbles in the Galactic Disk and Halo. I. Magnetohydrodynamic Simulations. *Shin Mineshige, Kazunari Shibata, & Paul R. Shapiro.* 409, 663, 107-C1 (1993)
- Numerical Solution of Wave Equations for the Stability of the Inner Cometo-Sheath. *Krishna M. Srivastava, Bruce T. Tsurutani, & Bruce E. Goldstein.* 409, 782, 108-G7 (1993)
- Force-free Magnetic Fields with Singular Current-Density Surfaces. *B. C. Low.* 409, 798, 109-A12 (1993)
- A Similarity Solution to the Kinematic $\alpha^2\omega$ Dynamo Equation with Time-dependent Coefficients. *Chung-Ming Ko.* 410, 128, 113-F8 (1993)
- The Structure of Protostellar Accretion Disks and the Origin of Bipolar Flows. *Mark Wardle & Ariele Königl.* 410, 218, 114-G6 (1993)
- A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung.* 410, 309, 115-G12 (1993)
- The Free Energies of Partially Open Coronal Magnetic Fields. *B. C. Low & D. F. Smith.* 410, 412, 117-B10 (1993)
- METEOROIDS**
- s-Process Ba Isotopic Compositions in Presolar SiC from the Murchison Meteorite. *C. A. Prombo, F. A. Podosek, S. Amari, & R. S. Lewis.* 410, 393, 117-A1 (1993)
- Carbon Stars and Isotopic Ba Anomalies in Meteoritic SiC Grains. *R. Gallino, C. M. Raiteri, & M. Busso.* 410, 400, 117-A10 (1993)
- METHODS: DATA ANALYSIS**
- Hierarchical Structure Analysis of Interstellar Clouds Using Nonorthogonal Wavelets. *William D. Langer, Robert W. Wilson, & Charles H. Anderson.* 408, L45, 89-C7 (1993)
- METHODS: NUMERICAL**
- Clusters and Groups of Galaxies as Cosmological Probes. *Haruhiko Ueda, Makoto Itoh, & Yasushi Suto.* 408, 3, 83-B5 (1993)
- Higher Order Statistics of the Galaxy Distribution Using Generating Functions. *István Szapudi & Alexander S. Szalay.* 408, 43, 83-E13 (1993)
- Softening in N-Body Simulations of Collisionless Systems. *Charles C. Dyer & Peter S. S. Ip.* 409, 60, 97-F7 (1993)
- Nonlinear Properties and Time Evolution of Gravitational Galaxy Clustering. *William C. Saslaw & Ravi K. Sheth.* 409, 504, 105-B13 (1993)
- Structure of Merger Remnants. II. Progenitors with Rotating Bulges. *Lars Hernquist.* 409, 548, 105-F12 (1993)
- The Interacting System NGC 7753–7752 (Arp 86). II. N-Body Modeling. *Heikki Salo & Eija Laurikainen.* 410, 586, 121-A6 (1993)
- Tidal Disruptions by Supermassive Black Holes: Hydrodynamic Evolution of Stars on a Schwarzschild Background. *Pablo Laguna, Warner A. Miller, Wojciech H. Zurek, & Melvyn B. Davies.* 410, L83, 125-G9 (1993)
- MOLECULAR DATA**
- Rotational Spectra of the $X^2\Sigma^+$ States of CaH and CaD. *C. I. Frum, J. J. Oh, E. A. Cohen, & H. M. Pickett.* 408, L61, 89-F1 (1993)
- The Millimeter-Wave Spectrum of CaH ($X^2\Sigma^+$). *W. L. Barclay, Jr., M. A. Anderson, & L. M. Ziurys.* 408, L65, 89-F8 (1993)
- Laboratory Detection of a New Free Radical C_4S ($^3\Sigma^-$). *Yasuhiro Hirahara, Yasuhiro Ohshima, & Yasuki Endo.* 408, L113, 95-F13 (1993)
- On the Carrier of the Band at 700 Nanometers in the Iron Hydride Spectrum. *John G. Phillips & Sumner P. Davis.* 409, 860, 109-G9 (1993)
- Laboratory Detection of C_3S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Ohi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami.* 410, L45, 118-D11 (1993)
- Laboratory Measurements of the Millimeter-Wave Spectra of Calcium Isocyanide. *Timothy C. Steimle, Shuji Saito, & Shuro Takano.* 410, L49, 118-C2 (1993)
- Laboratory Submillimeter-Wave Observation of the $N = 1-0$ Transition of the $ND(^3\Sigma^-)$ Radical. *Shuji Saito & Masahiro Goto.* 410, L53, 118-C7 (1993)
- High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmond, K. Ito, & M. H. Stevens.* 410, 837, 124-B8 (1993)
- Laboratory Spectra of Polycyclic Aromatic Hydrocarbon Ions and the Interstellar Extinction Curve. *Wei Lee & Thomas J. Wdowiak.* 410, L127, 126-E5 (1993)
- MOLECULAR PROCESSES**
- Theoretical Infrared Spectra of Some Model Polycyclic Aromatic Hydrocarbons: Effect of Ionization. *D. J. De Frees, M. D. Miller, D. Talbi, F. Pauzat, & Y. Ellinger.* 408, 530, 91-G5 (1993)
- Chemical Differentiation between Star-forming Regions: The Orion Hot Core and Compact Ridge. *P. Caselli, T. I. Hasegawa, & Eric Herbst.* 408, 548, 92-A11 (1993)
- The OH Distribution in Cometary Atmospheres: A Collisional Monte Carlo Model for Heavy Species. *Michael R. Combi, Brent J. Bos, & William H. Smyth.* 408, 668, 93-E1 (1993)
- Detection of H_3^+ Infrared Emission Lines in Saturn. *T. R. Geballe, M.-F. Jagod, & T. Oka.* 408, L109, 95-F7 (1993)
- Laboratory Detection of a New Free Radical C_4S ($^3\Sigma^-$). *Yasuhiro Hirahara, Yasuhiro Ohshima, & Yasuki Endo.* 408, L113, 95-F13 (1993)
- P/Halley: Effects of Time-dependent Production Rates on Spatial Emission Profiles. *Michael R. Combi & Uwe Fink.* 409, 790, 109-A1 (1993)
- H_2 in Interstellar and Extragalactic Ices: Infrared Characteristics, Ultraviolet Production, and Implications. *Scott A. Sandford & Louis J. Allamandola.* 409, L65, 111-F1 (1993)
- The Formation of Cyanopolyne Molecules in IRC +10216. *Isabelle Cherchneff, Alfred E. Glassgold, & Gary A. Mamon.* 410, 188, 114-D12 (1993)
- Laboratory Detection of C_3S by Pulsed-Discharge-Nozzle Fourier Transform Microwave Spectroscopy. *Yasuko Kasai, Kinichi Ohi, Yasuhiro Ohshima, Yasuhiro Hirahara, Yasuki Endo, Kentarou Kawaguchi, & Akinori Murakami.* 410, L45, 118-D11 (1993)
- NUCLEAR REACTIONS, NUCLEOSYNTHESIS, ABUNDANCES**
- The $^6Li/^7Li$ Ratio in the Metal-poor Halo Dwarfs HD 19445 and HD 84937. *Verne V. Smith, David L. Lambert, & Poul E. Nissen.* 408, 262, 86-D1 (1993)
- Toward a Unified Classical Model of the Sun: On the Sensitivity of Neutrinos and Helioseismology to the Microscopic Physics. *Sylvaine Turck-Chièze & Ilidio Lopes.* 408, 347, 87-D10 (1993)
- The Freeze-out Phase of SN 1987A: Implications for the Light Curve. *Claes Fransson & Cecilia Kozma.* 408, L25, 89-A1 (1993)
- Ar/S. *Christopher C. Stevenson, Marshall L. McCall, & Douglas L. Welch.* 408, 460, 90-G11 (1993)

Helium Destruction and Gamma-Ray Line Emission in Accreting Neutron Stars. *Lars Bildsten, Edwin E. Salpeter, & Ira Wasserman.* 408, 615, 92-G9 (1993)

Energy Generation in Convective Shells of Low-Mass, Low-Metallicity Asymptotic Giant Branch Stars. *Grant Bazan & John C. Lattanzio.* 409, 762, 108-E6 (1993)

The Interstellar $^7\text{Li}/^6\text{Li}$ Isotope Ratio toward ζ Ophiuchi and ζ Persei. *David M. Meyer, Isabel Hawkins, & Edward L. Wright.* 409, L61, 111-E8 (1993)

Evolution of Elliptical Galaxies. I. The Multiphase Model. *Federico Ferrini & Bianca Maria Poggianti.* 410, 44, 112-F4 (1993)

The s -Process between $A = 120$ and 124: Signature of Neutron Density and Temperature in Red Giants. *F. Käppeler, W. Schanz, K. Wisshak, & G. Reffo.* 410, 370, 116-F3 (1993)

s -Process Ba Isotopic Compositions in Presolar SiC from the Murchison Meteorite. *C. A. Prombo, F. A. Podosek, S. Amari, & R. S. Lewis.* 410, 393, 117-A1 (1993)

Carbon Stars and Isotopic Ba Anomalies in Meteoritic SiC Grains. *R. Gallino, C. M. Raiteri, & M. Busso.* 410, 400, 117-A10 (1993)

A Quasi-Steady State Cosmological Model with Creation of Matter. *F. Hoyle, G. Burbidge, & J. V. Narlikar.* 410, 437, 119-B7 (1993)

PLANETS AND SATELLITES: INDIVIDUAL

Saturn

Detection of H_2^+ Infrared Emission Lines in Saturn. *T. R. Geballe, M.-F. Jagod, & T. Oka.* 408, L109, 95-F7 (1993)

PLASMAS

Centrifugally Driven Winds from Protostellar Disks. I. Wind Model and Thermal Structure. *Pedro N. Safer.* 408, 115, 84-E6 (1993)

On the Thermal Stability of a Radiating Plasma Subject to Nonlocal Thermal Conduction. I. Linear Analysis. *E. Chun & R. Rosner.* 408, 678, 93-F1 (1993)

Particle Dynamics in Spherical Wave Fields of Rotating Magnets: Acceleration Boundary, Plasma Border, and $1/r_0^2$ Law of Asymptotic Energy. *K. O. Thielheim.* 409, 333, 101-C1 (1993)

POLARIZATION

Circularly Polarized Radio Emission from the T Tauri Star Hubble 4. *Stephen L. Skinner.* 408, 660, 93-D6 (1993)

Optical and Hubble Space Telescope Ultraviolet Spectropolarimetry of 3C 273 and PG 1114+445. *Paul S. Smith, Gary D. Schmidt, & Richard G. Allen.* 409, 604, 106-D13 (1993)

Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Pirola.* 410, 342, 116-C10 (1993)

Elliptical Polarimetry of the Interacting Binary Star V367 Cygni. *Nicholas M. Elias II.* 410, 785, 123-E1 (1993)

The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. *V. Pirola, P. Hakala, & G. V. Coyne, S.J.* 410, L107, 126-C3 (1993)

RADIATION MECHANISMS: GRAVITATIONAL

Upper Limits for Gravitational Radiation from Supermassive Coalescing Binaries. *J. D. Anderson, J. W. Armstrong, & E. L. Lau.* 408, 287, 86-F4 (1993)

RADIATION MECHANISMS: MISCELLANEOUS

Spatial Spectral Index Variations in Galactic Shell Supernova Remnants G39.2-0.3 and G41.1-0.3. *Martha C. Anderson & Lawrence Rudnick.* 408, 514, 91-E9 (1993)

Flaring and Quiescent Radio Emission of UX Arietis: A Time-dependent Model. *F. Chiuderi Drago & E. Franciosini.* 410, 301, 115-G3 (1993)

A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung.* 410, 309, 115-G12 (1993)

Relativistic Electron-Positron Beams in Gamma-Ray Bursters. I. A. Smith & Richard I. Epstein. 410, 315, 116-A6 (1993)

New 325 MHz Observations of H II Galaxies: The Mechanisms That Shape the Unusual Radio Spectra. *Hans-Jörg Deeg, Elias Brinks, Neb Duric, Uli Klein, & Evan Skillman.* 410, 626, 121-D13 (1993)

RADIATIVE TRANSFER

The Spectral Energy Distribution of Star-forming Regions. *Ralf Siebenmorgen.* 408, 218, 85-G3 (1993)

Light-induced Drift and Abundance Anomalies. *F. LeBlanc & G. Michaud.* 408, 251, 86-C1 (1993)

An Implicit Integral Method to Solve Selected Radiative Transfer Problems. I. Non-LTE Line Formation. *E. Simonneau & L. Crivellari.* 409, 830, 109-D12 (1993)

Mass Loss from Wolf-Rayet Stars Due to Radiation Pressure and Alfvén Waves. *L. C. dos Santos, V. Jatenco-Pereira, & R. Opher.* 410, 732, 122-G11 (1993)

RADIO CONTINUUM: GALAXIES

VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle.* 408, 81, 84-B4 (1993)

On the Separation of the Flaring Component's Emission in Variable Compact Extragalactic Radio Sources: Results from a Simple Shocked Relativistic Jet Model. *D. J. van der Walt.* 409, 126, 98-E3 (1993)

Molecular Gas in Powerful Radio Galaxies Detected by IRAS. *J. M. Mazzarella, J. R. Graham, D. B. Sanders, & S. Djorgovski.* 409, 170, 99-A13 (1993)

An Optically Luminous Radio Galaxy at $z = 3.22$ and the K - z Diagram at High Redshift. *Stephen A. Eales, Steve Rawlings, Mark Dickinson, Hyron Spinrad, Gary J. Hill, & Mark Lacy.* 409, 578, 106-B7 (1993)

A Search for Rapid Variability in the Broad H α Profiles of Seyfert and Radio Galaxies. *Michael Eracleous & Jules P. Halpern.* 409, 584, 106-C1 (1993)

Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell.* 410, 29, 112-D11 (1993)

Is 1308+326 a BL Lacertae Object or a Quasar? *D. C. Gabuzda, R. I. Kollgaard, D. H. Roberts, & J. F. C. Wardle.* 410, 39, 112-E12 (1993)

New 325 MHz Observations of H II Galaxies: The Mechanisms That Shape the Unusual Radio Spectra. *Hans-Jörg Deeg, Elias Brinks, Neb Duric, Uli Klein, & Evan Skillman.* 410, 626, 121-D13 (1993)

Submillimeter Continuum Emission from the Galactic Center Region. *W. R. F. Dent, H. E. Matthews, R. Wade, & W. D. Duncan.* 410, 650, 121-F11 (1993)

RADIO CONTINUUM: GENERAL

Further Radio Investigations of Gravitational Lensing in MG 0414+0534. *C. A. Katz & J. N. Hewitt.* 409, L9, 104-B11 (1993)

RADIO CONTINUUM: INTERSTELLAR

Spatial Spectral Index Variations in Galactic Shell Supernova Remnants G39.2-0.3 and G41.1-0.3. *Martha C. Anderson & Lawrence Rudnick.* 408, 514, 91-E9 (1993)

Deep VLA Imaging of Pulsar-powered Nebulae and the Beaming Fraction of Young Pulsars. *Dale A. Frail & David A. Moffett.* 408, 637, 93-B5 (1993)

Further Studies on the Champagne Phase of GM 24 (IRAS 17136-3617). *J. F. Gómez, J. M. Torrelles, M. Tapia, Y. Gómez, L. F. Rodríguez, M. Roth, & P. T. P. Ho.* 409, 269, 100-D10 (1993)

Radio and X-Ray Observations of OH 231.8+4.2. *Gregory B. Taylor & Mark Morris.* 409, 720, 108-A9 (1993)

RADIO CONTINUUM: STARS

Circularly Polarized Radio Emission from the T Tauri Star Hubble 4. *Stephen L. Skinner.* 408, 660, 93-D6 (1993)

The Radio Emission from the Type Ic Supernova SN 1990B. *Schuyler D. Van Dyk, Richard A. Sramek, Kurt W. Weiler, & Nino Panagia.* 409, 162, 99-A3 (1993)

A Highly Sensitive Radio Survey of Symbiotic Stars at 3.6 Centimeters. *E. R. Seaquist, M. Krogulec, & A. R. Taylor.* 410, 260, 115-C12 (1993)

Flaring and Quiescent Radio Emission of UX Arietis: A Time-dependent Model. *F. Chiuderi Drago & E. Franciosini.* 410, 301, 115-G3 (1993)

VLBI Astrometric Identification of the Radio-emitting Region in Algal and Determination of the Orientation of the Close Binary. *Jean-François Lestrade, Robert B. Phillips, Mark W. Hodges, & Robert A. Preston.* 410, 808, 123-G1 (1993)

RADIO LINES: ATOMIC

- The Velocity Field of Clusters of Galaxies within 100 Megaparsecs. II. Northern Clusters. *J. R. Mould, R. L. Akeson, G. D. Bothun, M. Han, J. P. Huchra, J. Roth, & R. A. Schommer.* 409, 14, 97-C1 (1993)

RADIO LINES: GALAXIES

- 21 Centimeter Study of Spiral Galaxies in Clusters. III. Neutral Gas Content, Star Formation, and Radio Continuum Properties. *Marco Scodreggio & Giuseppe Gavazzi.* 409, 110, 98-C8 (1993)
- Detection of CO Emission from Massive Molecular Clouds in the Inner Disk of M31. *Ronald J. Allen & J. Lequeux.* 410, L15, 117-G7 (1993)

RADIO LINES: ISM

- A Flattened Cloud Core in NGC 2024. *Paul T. P. Ho, Yun-Lou Peng, José M. Torrelles, José F. Gómez, Luis F. Rodríguez, & Jorge Cantó.* 408, 565, 92-C1 (1993)
- Laboratory Detection of a New Free Radical C_4S ($^3\Sigma^-$). *Yasuhiro Hirahara, Yasuhiro Ohshima, & Yasuki Endo.* 408, L113, 95-F13 (1993)
- Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. *M. Barsony, N. Z. Scoville, & C. J. Chandler.* 409, 275, 100-E4 (1993)
- Detection of Circumstellar Gas Associated with GG Tauri. *M. F. Skrutskie, R. L. Snell, K. M. Strom, S. E. Strom, S. Edwards, Y. Fukui, A. Mizuno, M. Hayashi, & N. Ohashi.* 409, 422, 102-C1 (1993)
- Modeling the Structure of H I in the Galactic Disk. *Joel N. Bregman, Daniel D. Kelson, & Gregory A. Ashe.* 409, 682, 107-D9 (1993)
- Density Wave Kinematics and Giant Molecular Association Formation in M51. *Richard J. Rand.* 410, 68, 113-A3 (1993)

RELATIVITY

- A Two-dimensional Relativistic ($\Gamma = 3.25$) Jet Simulation. *Maurice H. P. M. van Putten.* 408, L21, 88-G8 (1993)
- A Static Stable Universe. *David F. Crawford.* 410, 488, 119-F9 (1993)
- Tidal Disruptions by Supermassive Black Holes: Hydrodynamic Evolution of Stars on a Schwarzschild Background. *Pablo Laguna, Warner A. Miller, Wojciech H. Zurek, & Melvyn B. Davies.* 410, L83, 125-G9 (1993)

SCATTERING

- Imaging with Ultra-Resolution in the Presence of Strong Scattering. *T. J. Cornwell & Ramesh Narayan.* 408, L68, 89-G1 (1993)
- Compton Scattering and the Gamma-Ray Power-Law Spectrum in Markarian 421. *Andrzej A. Zdziarski & Julian H. Krolik.* 409, L33, 111-B1 (1993)
- Stellar Core Collapse: A Boltzmann Treatment of Neutrino-Electron Scattering. *Anthony Mezzacappa & Stephen W. Bruenn.* 410, 740, 123-A7 (1993)

SHOCK WAVES

- On the Separation of the Flaring Component's Emission in Variable Compact Extragalactic Radio Sources: Results from a Simple Shocked Relativistic Jet Model. *D. J. van der Walt.* 409, 126, 98-E3 (1993)
- Interstellar Matter near the Pleiades. IV. The Wake of the Pleiades through the Interstellar Medium in Taurus. *Richard E. White & John Bally.* 409, 234, 99-G13 (1993)
- Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. *M. Barsony, N. Z. Scoville, & C. J. Chandler.* 409, 275, 100-E4 (1993)
- The Injection and Acceleration of Particles in Oblique Shocks: A Unified Monte Carlo Description. *Matthew G. Baring, Donald C. Ellison, & Frank C. Jones.* 409, 327, 101-B8 (1993)
- The Formation and Evolution of Shocks in Stellar Jets from a Variable Wind. *Patrick Hartigan & John Raymond.* 409, 705, 107-G5 (1993)
- The Origin of Forbidden Line Emission from Young Stellar Objects. *Ana I. Gomez de Castro & Ralph E. Pudritz.* 409, 748, 108-D3 (1993)
- Chromospheric Heating by Acoustic Shocks: A Confrontation of GHRs Observations of α Tauri (K5 III) with Ab Initio Calculations. *P. G. Judge & M. Cuntz.* 409, 776, 108-F13 (1993)
- Three-dimensional Simulations of Protostellar Jets. *Elisabete M. de Gouveia Dal Pino & Willy Benz.* 410, 686, 122-B13 (1993)

- The Bow Shock and Mach Disk of HH 111V. *Jon A. Morse, Steve Heathcote, Gerald Cecil, Patrick Hartigan, & John C. Raymond.* 410, 764, 123-C5 (1993)

SOLAR SYSTEM: GENERAL

- Encounters with Protostellar Disks. I. Disk Tilt and the Nonzero Solar Obliquity. *Clayton H. Heller.* 408, 337, 87-C11 (1993)

STARS: ABUNDANCES

- Light-induced Drift and Abundance Anomalies. *F. LeBlanc & G. Michaud.* 408, 251, 86-C1 (1993)
- The $^6\text{Li}/^7\text{Li}$ Ratio in the Metal-poor Halo Dwarfs HD 19445 and HD 84937. *Verne V. Smith, David L. Lambert, & Poul E. Nissen.* 408, 262, 86-D1 (1993)
- High-Resolution Mid-Infrared Spectra of Co II, Ni I, and Fe II in SN 1987A. *D. E. Jennings, R. J. Boyle, G. R. Wiedemann, & S. H. Moseley.* 408, 277, 86-E5 (1993)
- LSIV $-12^\circ 11'$: A Candidate Halo Proto-Planetary Nebula. *E. S. Conlon, P. L. Dufton, R. J. H. McCausland, & F. P. Keenan.* 408, 593, 92-E11 (1993)
- Imaging of Fields in the Inner Halo and Outer Disk of M31. *T. J. Davidge.* 409, 190, 99-C8 (1993)
- Reddening Errors and the Post-Main-Sequence Distribution of Stars in the H-R Diagram of the Large Magellanic Cloud. *N. Rathnasree.* 410, L99, 126-B5 (1993)

STARS: AGB AND POST-AGB

- Radio and X-Ray Observations of OH 231.8+4.2. *Gregory B. Taylor & Mark Morris.* 409, 720, 108-A9 (1993)

STARS: BINARIES: CLOSE

- Upper Limits for Gravitational Radiation from Supermassive Coalescing Binaries. *J. D. Anderson, J. W. Armstrong, & E. L. Lau.* 408, 287, 86-F4 (1993)
- The Secondary Maxima in Black Hole X-Ray Nova Light Curves: Clues toward a Complete Picture. *Wan Chen, Mario Livio, & Neil Gehrels.* 408, L5, 88-E8 (1993)
- Optical and X-Ray Observations of the Low-Mass X-Ray Binary EXO 0748-676. *Brian Thomas, Robin Corbet, Thomas Augsteijn, Paul Callanan, & Alan P. Smale.* 408, 651, 93-C7 (1993)
- Hydrodynamics of Winds from Irradiated Companion Stars in Low-Mass X-Ray Binaries. *Marco Tavani & Richard London.* 410, 281, 115-E8 (1993)
- The Nature of the Doppler Shift Residuals and Some Peculiar Phenomena of SS 433. *T. Iijima.* 410, 295, 115-F10 (1993)
- Flaring and Quiescent Radio Emission of UX Arietis: A Time-dependent Model. *F. Chiuderi Drago & E. Franciosini.* 410, 301, 115-G3 (1993)
- A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung.* 410, 309, 115-G12 (1993)
- Discovery of Orbital Decay in SMC X-1. *A. Levine, S. Rappaport, J. E. Deeter, P. E. Boynton, & F. Nagase.* 410, 328, 116-B8 (1993)
- Wind-driven Angular Momentum Loss in Binary Systems. I. Ballistic Case. *Leigh Brookshaw & Marco Tavani.* 410, 719, 122-F6 (1993)
- Elliptical Polarimetry of the Interacting Binary Star V567 Cygni. *Nicholas M. Elias II.* 410, 785, 123-E1 (1993)
- Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT. *A. P. Smale, C. Done, R. F. Mushotsky, K. A. Weaver, P. J. Serlemitsos, F. E. Marshall, R. Petre, K. M. Jahoda, E. A. Boldt, J. H. Swank, A. E. Szymkowiak, R. L. Kelley, & K. Arnaud.* 410, 796, 123-F1 (1993)
- Discovery of Multiple Low-Luminosity X-Ray Sources in NGC 6397. *Adrienne M. Cool, Jonathan E. Grindlay, Martin Krockenberger, & Charles D. Bailyn.* 410, L103, 126-B11 (1993)
- The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. *V. Pirola, P. Hakala, & G. V. Coyne.* 410, L107, 126-C3 (1993)

STARS: BINARIES: ECLIPSING

- The Discovery of Pulsed Iron Line Emission from Centaurus X-3. *C. S. R. Day, F. Nagase, K. Asai, & T. Takeshima.* 408, 656, 93-D1 (1993)
- Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat,*

- L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Pirola.* 410, 342, 116-C10 (1993)
- Hubble Space Telescope Spectra of the Phase-modulated Wind in the SMC O+WR Binary R31. J. B. Hutchings, L. Bianchi, & S. C. Morris.* 410, 803, 123-F10 (1993)
- VLBI Astrometric Identification of the Radio-emitting Region in Algol and Determination of the Orientation of the Close Binary. Jean-François Lestrade, Robert B. Phillips, Mark W. Hodges, & Robert A. Preston.* 410, 808, 123-G1 (1993)
- STARS: BINARIES: GENERAL**
- Low-Mass X-Ray Binaries and Millisecond Pulsars in Globular Clusters. Kaiyou Chen, John Middledich, & Malvin Ruderman.* 408, L17, 88-G1 (1993)
- Multiplicity and the Ages of the Stars in the Taurus Star-forming Region. M. Simon, A. M. Ghez, & Ch. Leinert.* 408, L33, 89-B1 (1993)
- A New Herbig-Haro Flow in the HH 1-2 Complex. Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga.* 408, L49, 89-D1 (1993)
- Canada-France-Hawaii Telescope Observations of Globular Cluster Cores: Blue Straggler Stars in M3 (NGC 5272, GC 1339+286). Michael Bolte, James E. Hesser, & Peter B. Stetson.* 408, L89, 95-C11 (1993)
- Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith.* 408, L93, 95-D7 (1993)
- Postcollapse Evolution of Globular Clusters Dominated by Tidal Binary Heating. Hyung Mok Lee & Jeremiah P. Ostriker.* 409, 617, 106-F3 (1993)
- Collapse and Fragmentation of Molecular Cloud Cores. I. Moderately Centrally Condensed Cores. Alan P. Boss.* 410, 157, 114-B1 (1993)
- A Highly Sensitive Radio Survey of Symbiotic Stars at 3.6 Centimeters. E. R. Seaquist, M. Krogulec, & A. R. Taylor.* 410, 260, 115-C12 (1993)
- JHK Photometry of WD 0950+139. Michael S. Fulbright & James Liebert.* 410, 275, 115-E1 (1993)
- The Binary Pulsar PSR 1908+00 in NGC 6760. W. T. S. Deich, J. Middledich, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan.* 410, L95, 126-A13 (1993)
- Reddening Errors and the Post-Main-Sequence Distribution of Stars in the H-R Diagram of the Large Magellanic Cloud. N. Rathnasree.* 410, L99, 126-B5 (1993)
- STARS: BINARIES: SPECTROSCOPIC**
- On the Mass of Nova DQ Herculis (1934). Keith Horne, William F. Welsh, & Richard A. Wade.* 410, 357, 116-E1 (1993)
- Plaskett's Star (HD 47129): More and More Curious. Anne B. Underhill.* 410, 365, 116-E11 (1993)
- STARS: BINARIES: VISUAL**
- Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith.* 408, L93, 95-D7 (1993)
- STARS: CARBON**
- The Formation of Cyanopolyne Molecules in IRC +10216. Isabelle Cherchneff, Alfred E. Glassgold, & Gary A. Mamon.* 410, 188, 114-D12 (1993)
- Carbon Stars and Isotopic Ba Anomalies in Meteoritic SiC Grains. R. Gallino, C. M. Raiteri, & M. Busso.* 410, 400, 117-A10 (1993)
- STARS: CHROMOSPHERES**
- A Catalog of Stellar Lyman-Alpha Fluxes. Wayne Landsman & Theodore Simon.* 408, 305, 87-A1 (1993)
- Chromospheric Heating by Acoustic Shocks: A Confrontation of GHRS Observations of α Tauri (K5 III) with Ab Initio Calculations. P. G. Judge & M. Cuntz.* 409, 776, 108-F13 (1993)
- STARS: CIRCUMSTELLAR MATTER**
- η Carinae: A New Model. J. M. Borgwald & M. W. Friedlander.* 408, 230, 86-A3 (1993)
- Circumstellar Molecular Gas of the HH 34 and HH 111 Exciting Stars. Karl R. Stapelfeldt & Nicholas Z. Scoville.* 408, 239, 86-B1 (1993)
- The Infrared Temporal Evolution of FG Sagittae. Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- LSIV -12°111: A Candidate Halo Proto-Planetary Nebula. E. S. Conlon, P. L. Dufton, R. J. H. McCausland, & F. P. Keenan.* 408, 593, 92-E11 (1993)
- Dynamics of the Envelopes of Be Stars and Shell Stars in the Equatorial Plane: A Potential Similarity and Difference Based upon the Continuous Energy Distribution. J. M. Marlborough, Haiqi Chen, & L. B. F. M. Waters.* 408, 646, 93-C1 (1993)
- Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith.* 408, L93, 95-D7 (1993)
- Detection of Circumstellar Gas Associated with GG Tauri. M. F. Skrutskie, R. L. Snell, K. M. Strom, S. E. Strom, S. Edwards, Y. Fukui, A. Mizuno, M. Hayashi, & N. Ohashi.* 409, 422, 102-C1 (1993)
- Equatorial Disk Formation around Rotating Stars Due to Ram Pressure Confinement by the Stellar Wind. J. E. Bjorkman & J. P. Cassinelli.* 409, 429, 102-C10 (1993)
- Circumstellar Shells Resolved in IRAS Survey Data. II. Analysis. K. Young, T. G. Phillips, & G. R. Knapp.* 409, 725, 108-B3 (1993)
- The Formation of Cyanopolyne Molecules in IRC +10216. Isabelle Cherchneff, Alfred E. Glassgold, & Gary A. Mamon.* 410, 188, 114-D12 (1993)
- Search for Ionized Cores in Proto-Planetary Nebulae, and the Asymptotic Giant Branch to Planetary Nebula Transition. Hans Ulrich Käufl, Alvio Renzini, & Letizia Stanghellini.* 410, 251, 115-C1 (1993)
- Coronographic Imaging of the Bipolar Nebula around the Luminous Blue Variable R127. Mark Clampin, Antonella Nota, David A. Golimowski, Claus Leitherer, & Samuel T. Durrance.* 410, L35, 118-C5 (1993)
- The Dynamics of Stellar Outflows Dominated by Interaction of Dust and Radiation. Nathan Netzer & Moshe Elitzur.* 410, 701, 122-D11 (1993)
- Elliptical Polarimetry of the Interacting Binary Star V367 Cygni. Nicholas M. Elias II.* 410, 785, 123-E1 (1993)
- STARS: CORONAE**
- Stellar Coronae at the End of the Main Sequence: A ROSAT Survey of the Late M Dwarfs. Thomas A. Fleming, Mark S. Giampapa, J. H. M. M. Schmitt, & Jay A. Bookbinder.* 410, 387, 116-G8 (1993)
- STARS: DISTANCES**
- A Provisional RR Lyrae Distance Scale. Norman R. Simon & Christine M. Clement.* 410, 526, 120-C1 (1993)
- STARS: EARLY-TYPE**
- Far-Ultraviolet Stellar Photometry: A Field in Monoceros. Edward G. Schmidt & George R. Carruthers.* 408, 484, 91-C1 (1993)
- Dynamics of the Envelopes of Be Stars and Shell Stars in the Equatorial Plane: A Potential Similarity and Difference Based upon the Continuous Energy Distribution. J. M. Marlborough, Haiqi Chen, & L. B. F. M. Waters.* 408, 646, 93-C1 (1993)
- Equatorial Disk Formation around Rotating Stars Due to Ram Pressure Confinement by the Stellar Wind. J. E. Bjorkman & J. P. Cassinelli.* 409, 429, 102-C10 (1993)
- Ultraviolet Properties of Individual Hot Stars in Globular Cluster Cores. I. NGC 1904 (M79). B. Altner & T. A. Matilsky.* 410, 116, 113-E8 (1993)
- STARS: EMISSION-LINE, BE**
- Dynamic Processes in Be Star Atmospheres. I. "Dimple" Formation in the He sci λ 6678 Line of λ Eridani. Myron A. Smith & Ronald S. Polidan.* 408, 323, 87-B8 (1993)
- Dynamics of the Envelopes of Be Stars and Shell Stars in the Equatorial Plane: A Potential Similarity and Difference Based upon the Continuous Energy Distribution. J. M. Marlborough, Haiqi Chen, & L. B. F. M. Waters.* 408, 646, 93-C1 (1993)
- Equatorial Disk Formation around Rotating Stars Due to Ram Pressure Confinement by the Stellar Wind. J. E. Bjorkman & J. P. Cassinelli.* 409, 429, 102-C10 (1993)
- The Origin of Forbidden Line Emission from Young Stellar Objects. Ana I. Gomez de Castro & Ralph E. Pudritz.* 409, 748, 108-D3 (1993)

- A Giant X-Ray Flare on λ Eridani (B2e). *Myron A. Smith, Carol A. Grady, Geraldine J. Peters, & Eric D. Feigelson.* 409, L49, 111-D1 (1993)
- Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560. *A. G. Michalitsianos, M. Perez, S. N. Shore, S. P. Maran, M. Karovska, G. Sonneborn, J. R. Webb, Thomas G. Barnes III, Marian L. Frueh, R. J. Oliveren, & S. G. Starrfield.* 409, L53, 111-D8 (1993)
- STARS: EVOLUTION**
- The Age of the Large Magellanic Cloud Cluster NGC 2031. *J. R. Mould, D. A. Xystus, & G. S. Da Costa.* 408, 108, 84-D8 (1993)
- Origin and Radio Pulse Properties of Millisecond Pulsars. *Kaiyou Chen & Malvin Ruderman.* 408, 179, 85-C12 (1993)
- Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibazaki, Ken'ichi Nomoto, & Sachiko Tsuruta.* 408, 186, 85-D7 (1993)
- The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)
- Dynamical Instability as the Cause of the Massive Outbursts in η Carinae and Other Luminous Blue Variables. *Richard B. Stothers & Chao-wen Chin.* 408, L85, 95-C5 (1993)
- On Partial Mixing Zones in Horizontal-Branch Stellar Cores. *Ben Dorman & Robert T. Rood.* 409, 387, 101-G3 (1993)
- On the Stellar Progenitor of the Type Ib Supernova 1984L. *E. Baron, Timothy R. Young, & David Branch.* 409, 417, 102-B10 (1993)
- The Evolution of Angular Momentum among Zero-Age Main-Sequence Solar-Type Stars. *David R. Soderblom, John R. Stauffer, Keith B. MacGregor, & Burton F. Jones.* 409, 624, 106-F13 (1993)
- Theoretical Models for Massive Stars in Young Magellanic Cloud Stellar Clusters. *Enzo Brocato & Vittorio Castellani.* 410, 99, 113-D1 (1993)
- Search for Ionized Cores in Proto-Planetary Nebulae, and the Asymptotic Giant Branch to Planetary Nebula Transition. *Hans Ulrich Käufl, Alvio Renzini, & Letizia Stanghellini.* 410, 251, 115-C1 (1993)
- Reddening Errors and the Post-Main-Sequence Distribution of Stars in the H-R Diagram of the Large Magellanic Cloud. *N. Rathnasree.* 410, L99, 126-B5 (1993)
- STARS: FLARE**
- A Giant X-Ray Flare on λ Eridani (B2e). *Myron A. Smith, Carol A. Grady, Geraldine J. Peters, & Eric D. Feigelson.* 409, L49, 111-D1 (1993)
- STARS: FORMATION**
- Centrifugally Driven Winds from Protostellar Disks. I. Wind Model and Thermal Structure. *Pedro N. Safer.* 408, 115, 84-E6 (1993)
- The Spectral Energy Distribution of Star-forming Regions. *Ralf Siebenmorgen.* 408, 218, 85-G3 (1993)
- Multiplicity and the Ages of the Stars in the Taurus Star-forming Region. *M. Simon, A. M. Ghez, & Ch. Leinert.* 408, L33, 89-B1 (1993)
- Infrared Images of the Young Cluster NGC 2264. *Charles J. Lada, Erick T. Young, & Thomas P. Greene.* 408, 471, 91-A11 (1993)
- Massive Star Formation near the Galactic Center and the Fate of the Stellar Remnants. *Mark Morris.* 408, 496, 91-D1 (1993)
- Chemical Differentiation between Star-forming Regions: The Orion Hot Core and Compact Ridge. *P. Caselli, T. I. Hasegawa, & Eric Herbst.* 408, 548, 92-A11 (1993)
- Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. *D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith.* 408, L93, 95-D7 (1993)
- Near-Infrared Discovery of the L810 Nebula Illuminator. *João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke.* 408, L101, 95-E9 (1993)
- 21 Centimeter Study of Spiral Galaxies in Clusters. III. Neutral Gas Content, Star Formation, and Radio Continuum Properties. *Marco Scodreggio & Giuseppe Gavazzi.* 409, 110, 98-C8 (1993)
- Evolution of Elliptical Galaxies. I. The Multiphase Model. *Federico Ferrini & Bianca Maria Poggianti.* 410, 44, 112-F4 (1993)
- A Similarity Solution to the Kinematic $\alpha^2\omega$ Dynamo Equation with Time-dependent Coefficients. *Chung-Ming Ko.* 410, 128, 113-F8 (1993)
- Collapse and Fragmentation of Molecular Cloud Cores. I. Moderately Centrally Condensed Cores. *Alan P. Boss.* 410, 157, 114-B1 (1993)
- Discovery of New Objects in the Orion Nebula on HST Images: Shocks, Compact Sources, and Protoplanetary Disks. *C. R. O'Dell, Zheng Wen, & Xihai Hu.* 410, 696, 122-C11 (1993)
- STARS: FUNDAMENTAL PARAMETERS**
- Multiplicity and the Ages of the Stars in the Taurus Star-forming Region. *M. Simon, A. M. Ghez, & Ch. Leinert.* 408, L33, 89-B1 (1993)
- STARS: GIANT**
- On Partial Mixing Zones in Horizontal-Branch Stellar Cores. *Ben Dorman & Robert T. Rood.* 409, 387, 101-G3 (1993)
- Chromospheric Heating by Acoustic Shocks: A Confrontation of GHRS Observations of α Tauri (K5 III) with Ab Initio Calculations. *P. G. Judge & M. Cuntz.* 409, 776, 108-F13 (1993)
- The s-Process between A = 120 and 124: Signature of Neutron Density and Temperature in Red Giants. *F. Käppeler, W. Schanz, K. Wisshak, & G. Reffo.* 410, 370, 116-F3 (1993)
- STARS: HERTZSPRUNG-RUSSELL DIAGRAM**
- The Distance to Nearby Galaxy NGC 3109 Based on the Tip of the Red Giant Branch. *Myung Gyoong Lee.* 408, 409, 90-C8 (1993)
- Reddening Errors and the Post-Main-Sequence Distribution of Stars in the H-R Diagram of the Large Magellanic Cloud. *N. Rathnasree.* 410, L99, 126-B5 (1993)
- STARS: HORIZONTAL-BRANCH**
- Ultraviolet Properties of Individual Hot Stars in Globular Cluster Cores. I. NGC 1904 (M79). *B. Altner & T. A. Matilsky.* 410, 116, 113-E8 (1993)
- STARS: INDIVIDUAL**
- Constellation Name: AE Aquarii**
- On the Location of the Oscillations in AE Aquarii. *William F. Welsh, Keith Horne, & Richard Gomer.* 410, L39, 118-D1 (1993)
- Constellation Name: UX Arietis**
- Flaring and Quiescent Radio Emission of UX Arietis: A Time-dependent Model. *F. Chiuderi Drago & E. Franciosi.* 410, 301, 115-G3 (1993)
- Constellation Name: η Carinae**
- η Carinae: A New Model. *J. M. Borgwald & M. W. Friedlander.* 408, 230, 86-A3 (1993)
- Dynamical Instability as the Cause of the Massive Outbursts in η Carinae and Other Luminous Blue Variables. *Richard B. Stothers & Chao-wen Chin.* 408, L85, 95-C5 (1993)
- Constellation Name: Centaurus X-3**
- The Discovery of Pulsed Iron Line Emission from Centaurus X-3. *C. S. R. Day, F. Nagase, K. Asai, & T. Takeshima.* 408, 656, 93-D1 (1993)
- Constellation Name: Cygnus X-2**
- Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT. *A. P. Smale, C. Done, R. F. Mushotsky, K. A. Weaver, P. J. Serlemitsos, F. E. Marshall, R. Petre, K. M. Jahoda, E. A. Boldt, J. H. Swank, A. E. Szymkowiak, R. L. Kelley, & K. Arnaud.* 410, 796, 123-F1 (1993)
- Constellation Name: V367 Cygni**
- Elliptical Polarimetry of the Interacting Binary Star V367 Cygni. *Nicholas M. Elias II.* 410, 785, 123-E1 (1993)
- Constellation Name: V444 Cygni**
- Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Piirola.* 410, 342, 116-C10 (1993)
- Constellation Name: λ Eridani**
- Dynamic Processes in Be Star Atmospheres. I. "Dimple" Formation in the He sci λ 6678 Line of λ Eridani. *Myron A. Smith & Ronald S. Polidan.* 408, 323, 87-B8 (1993)

A Giant X-Ray Flare on λ Eridani (B2e). *Myron A. Smith, Carol A. Grady, Geraldine J. Peters, & Eric D. Feigelson.* 409, L49, 111-D1 (1993)

Constellation Name: σ Gemorum

Doppler Imaging Stars with Moderate Rotation: The Spot Distribution on σ Gemorum. *Artie P. Hatzes.* 410, 777, 123-D7 (1993)

Constellation Name: Nova DQ Herculis

On the Mass of Nova DQ Herculis (1934). *Keith Horne, William F. Welsh, & Richard A. Wade.* 410, 357, 116-E1 (1993)

Constellation Name: α Orionis

Detection of O I and Si II Far-Infrared Fine-Structure Emission from α Orionis. *Michael R. Haas & Alfred E. Glassgold.* 410, L111, 126-C9 (1993)

Constellation Name: β Persel

VLBI Astrometric Identification of the Radio-emitting Region in Algol and Determination of the Orientation of the Close Binary. *Jean-François Lestrade, Robert B. Phillips, Mark W. Hodges, & Robert A. Preston.* 410, 808, 123-G1 (1993)

Constellation Name: FG Sagittae

The Infrared Temporal Evolution of FG Sagittae. *Charles E. Woodward, G. F. Lawrence, R. D. Gehrz, Terry J. Jones, H. A. Kobulnicky, James Cole, Tracy Hodge, & Harley A. Thronson, Jr.* 408, L37, 89-B8 (1993)

Constellation Name: α Tauri

Chromospheric Heating by Acoustic Shocks: A Confrontation of GHRs Observations of α Tauri (K5 III) with Ab Initio Calculations. *P. G. Judge & M. Cuntz.* 409, 776, 108-F13 (1993)

Constellation Name: DG Tauri

High-Resolution Long-Slit Spectral Imaging of the Mass Outflows in the Immediate Vicinity of DG Tauri. *J. Solf & K. H. Böhm.* 410, L31, 118-F13 (1993)

Constellation Name: GG Tauri

Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. *D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith.* 408, L93, 95-D7 (1993)

Detection of Circumstellar Gas Associated with GG Tauri. *M. F. Skrutskie, R. L. Snell, K. M. Strom, S. E. Strom, S. Edwards, Y. Fukui, A. Mizuno, M. Hayashi, & N. Ohashi.* 409, 422, 102-C1 (1993)

Bright Star Number: HR 3126

An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright.* 409, 404, 102-A8 (1993)

Henry Draper Number: HD 19445

The $^6\text{Li}/^7\text{Li}$ Ratio in the Metal-poor Halo Dwarfs HD 19445 and HD 84937. *Verne V. Smith, David L. Lambert, & Poul E. Nissen.* 408, 262, 86-D1 (1993)

Henry Draper Number: HD 47129

Plaskett's Star (HD 47129): More and More Curious. *Anne B. Underhill.* 410, 365, 116-E11 (1993)

Henry Draper Number: HD 44179

Spatially Resolved Spectra of the Unidentified Infrared Features around HD 44179 (The Red Rectangle). *G. C. Sloan, G. L. Grasdalén, & Paul D. LeVan.* 409, 412, 102-B3 (1993)

Henry Draper Number: HD 62542

Interstellar Extinction in the Infrared: The Molecular Cloud toward HD 62542. *D. C. B. Whittet, P. G. Martin, E. L. Fitzpatrick, & D. Massa.* 408, 573, 92-C11 (1993)

Henry Draper Number: HD 84937

The $^6\text{Li}/^7\text{Li}$ Ratio in the Metal-poor Halo Dwarfs HD 19445 and HD 84937. *Verne V. Smith, David L. Lambert, & Poul E. Nissen.* 408, 262, 86-D1 (1993)

Henry Draper Number: HD 93521

Composition of Interstellar Clouds in the Disk and Halo. I. HD 93521. *Lyman Spitzer, Jr., & Edward L. Fitzpatrick.* 409, 299, 100-G3 (1993)

Neutrino Decay and the Heat Budget of the Warm Interstellar Medium. *D. W. Sciama.* 409, L25, 104-D9 (1993)

Name: Hubble 4

Circularly Polarized Radio Emission from the T Tauri Star Hubble 4. *Stephen L. Skinner.* 408, 660, 93-D6 (1993)

Alphanumeric: EXO 0748-676

Optical and X-Ray Observations of the Low-Mass X-Ray Binary EXO 0748-676. *Brian Thomas, Robin Corbet, Thomas Augusteijn, Paul Callanan, & Alan P. Smale.* 408, 651, 93-C7 (1993)

Alphanumeric: HH 34

Circumstellar Molecular Gas of the HH 34 and HH 111 Exciting Stars. *Karl R. Stapelfeldt & Nicholas Z. Scoville.* 408, 239, 86-B1 (1993)

Alphanumeric: HH 111

Circumstellar Molecular Gas of the HH 34 and HH 111 Exciting Stars. *Karl R. Stapelfeldt & Nicholas Z. Scoville.* 408, 239, 86-B1 (1993)

The Bow Shock and Mach Disk of HH 111V. *Jon A. Morse, Steve Heathcote, Gerald Cecil, Patrick Hartigan, & John C. Raymond.* 410, 764, 123-C5 (1993)

Alphanumeric: HZ 43

Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman.* 408, L41, 89-C1 (1993)

Alphanumeric: IRC +10216

The Formation of Cyanopolyne Molecules in IRC +10216. *Isabelle Cherchneff, Alfred E. Glassgold, & Gary A. Mamon.* 410, 188, 114-D12 (1993)

Alphanumeric: MWC 560

Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560. *A. G. Michalitsianos, M. Perez, S. N. Shore, S. P. Maran, M. Karovska, G. Sonneborn, J. R. Webb, Thomas G. Barnes III, Marian L. Frueh, R. J. Oliveren, & S. G. Starrfield.* 409, L53, 111-D8 (1993)

Alphanumeric: PSR B1758-23

A Young, Glitching Pulsar near the Direction of W28. *V. M. Kaspi, A. G. Lyne, R. N. Manchester, S. Johnston, N. D'Amico, & S. L. Shemar.* 409, L57, 111-E1 (1993)

Alphanumeric: R127

Coronographic Imaging of the Bipolar Nebula around the Luminous Blue Variable R127. *Mark Clampin, Antonella Nota, David A. Golimowski, Claus Leitherer, & Samuel T. Durrance.* 410, L35, 118-C5 (1993)

Alphanumeric: RE 0751+14

The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. *V. Pirola, P. Hakala, & G. V. Coyne, S.J.* 410, L107, 126-C3 (1993)

Alphanumeric: SMC R31

Hubble Space Telescope Spectra of the Phase-modulated Wind in the SMC O+WR Binary R31. *J. B. Hutchings, L. Bianchi, & S. C. Morris.* 410, 803, 123-F10 (1993)

Alphanumeric: SS 433

The Nature of the Doppler Shift Residuals and Some Peculiar Phenomena of SS 433. *T. Iijima.* 410, 295, 115-F10 (1993)

Alphanumeric: WD 0950+139

JHK Photometry of WD 0950+139. *Michael S. Fulbright & James Liebert.* 410, 275, 115-E1 (1993)

STARS: INTERIORS

Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibasaki, Ken'ichi Nomoto, & Sachiko Tsuruta.* 408, 186, 85-D7 (1993)

Neutron Star Dynamos and the Origins of Pulsar Magnetism. *Christopher Thompson & Robert C. Duncan.* 408, 194, 85-E4 (1993)

Unstable Degenerates Revisited. *John Faulkner.* 408, 600, 92-F5 (1993)

On Partial Mixing Zones in Horizontal-Branch Stellar Cores. *Ben Dorman & Robert T. Rood.* 409, 387, 101-G3 (1993)

Energy Generation in Convective Shells of Low-Mass, Low-Metallicity Asymptotic Giant Branch Stars. *Grant Bazan & John C. Lattanzio.* 409, 762, 108-E6 (1993)

Theoretical Models for Massive Stars in Young Magellanic Cloud Stellar Clusters. *Enzo Brocato & Vittorio Castellani.* 410, 99, 113-D1 (1993)

- Search for Ionized Cores in Proto-Planetary Nebulae, and the Asymptotic Giant Branch to Planetary Nebula Transition. *Hans Ulrich Käuf, Alvio Renzini, & Letizia Stanghellini.* 410, 251, 115-C1 (1993)
- Stellar Core Collapse: A Boltzmann Treatment of Neutrino-Electron Scattering. *Anthony Mezzacappa & Stephen W. Bruenn.* 410, 740, 123-A7 (1993)
- STARS: KINEMATICS**
- Canada-France-Hawaii Telescope Observations of Globular Cluster Cores: Blue Straggler Stars in M3 (NGC 5272, GC 1339+286). *Michael Bolte, James E. Hesser, & Peter B. Stetson.* 408, L89, 95-C11 (1993)
- STARS: LATE-TYPE**
- An Infrared Study of the Remarkable Dusty M Star HR 3126. *J. E. Chiar, D. C. B. Whittet, D. K. Aitken, P. F. Roche, C. H. Smith, H. J. Walker, P. A. Whitelock, & C. Wright.* 409, 404, 102-A8 (1993)
- Circumstellar Shells Resolved in IRAS Survey Data. II. Analysis. *K. Young, T. G. Phillips, & G. R. Knapp.* 409, 725, 108-B3 (1993)
- A Highly Sensitive Radio Survey of Symbiotic Stars at 3.6 Centimeters. *E. R. Seaquist, M. Krogulec, & A. R. Taylor.* 410, 260, 115-C12 (1993)
- Stellar Coronae at the End of the Main Sequence: A ROSAT Survey of the Late M Dwarfs. *Thomas A. Fleming, Mark S. Giampapa, J. H. M. M. Schmitt, & Jay A. Bookbinder.* 410, 387, 116-G8 (1993)
- STARS: LUMINOSITY FUNCTION, MASS FUNCTION**
- Massive Star Formation near the Galactic Center and the Fate of the Stellar Remnants. *Mark Morris.* 408, 496, 91-D1 (1993)
- STARS: MAGNETIC FIELDS**
- Magnetic Field Topology in Pulsars. *Jonathan Arons.* 408, 160, 85-B1 (1993)
- Origin and Radio Pulse Properties of Millisecond Pulsars. *Kaiyou Chen & Malvin Ruderman.* 408, 179, 85-C12 (1993)
- Neutron Star Dynamos and the Origins of Pulsar Magnetism. *Christopher Thompson & Robert C. Duncan.* 408, 194, 85-E4 (1993)
- Relativistic Electron-Positron Beams in Gamma-Ray Bursters. *I. A. Smith & Richard I. Epstein.* 410, 315, 116-A6 (1993)
- STARS: MASS LOSS**
- Winds from Accretion Disks: Ultraviolet Line Formation in Cataclysmic Variables. *Isaac Shlosman & Peter Vitello.* 409, 372, 101-F1 (1993)
- Equatorial Disk Formation around Rotating Stars Due to Ram Pressure Confinement by the Stellar Wind. *J. E. Bjorkman & J. P. Cassinelli.* 409, 429, 102-C10 (1993)
- The Formation and Evolution of Shocks in Stellar Jets from a Variable Wind. *Patrick Hartigan & John Raymond.* 409, 705, 107-G5 (1993)
- Radio and X-Ray Observations of OH 231.8+4.2. *Gregory B. Taylor & Mark Morris.* 409, 720, 108-A9 (1993)
- Circumstellar Shells Resolved in IRAS Survey Data. II. Analysis. *K. Young, T. G. Phillips, & G. R. Knapp.* 409, 725, 108-B3 (1993)
- The Origin of Forbidden Line Emission from Young Stellar Objects. *Ana I. Gomez de Castro & Ralph E. Pudritz.* 409, 748, 108-D3 (1993)
- The Structure of Protostellar Accretion Disks and the Origin of Bipolar Flows. *Mark Wardle & Ariele Königl.* 410, 218, 114-G6 (1993)
- Hydrodynamics of Winds from Irradiated Companion Stars in Low-Mass X-Ray Binaries. *Marco Tavecchio & Richard London.* 410, 281, 115-E8 (1993)
- Coronographic Imaging of the Bipolar Nebula around the Luminous Blue Variable R127. *Mark Clampin, Antonella Nota, David A. Golimowski, Claus Leitherer, & Samuel T. Durrance.* 410, L35, 118-C5 (1993)
- Three-dimensional Simulations of Protostellar Jets. *Elisabete M. de Gouveia Dal Pino & Willy Benz.* 410, 686, 122-B13 (1993)
- The Dynamics of Stellar Outflows Dominated by Interaction of Dust and Radiation. *Nathan Netzer & Moshe Elitzur.* 410, 701, 122-D11 (1993)
- Wind-driven Angular Momentum Loss in Binary Systems. I. Ballistic Case. *Leigh Brookshaw & Marco Tavecchio.* 410, 719, 122-F6 (1993)
- Mass Loss from Wolf-Rayet Stars Due to Radiation Pressure and Alfvén Waves. *L. C. dos Santos, V. Jatenco-Pereira, & R. Opher.* 410, 732, 122-G11 (1993)
- Hubble Space Telescope Spectra of the Phase-modulated Wind in the SMC O+WR Binary R31. *J. B. Hutchings, L. Bianchi, & S. C. Morris.* 410, 803, 123-F10 (1993)
- Detection of O I and Si II Far-Infrared Fine-Structure Emission from α Orionis. *Michael R. Haas & Alfred E. Glassgold.* 410, L111, 126-C9 (1993)
- STARS: NEUTRON**
- Magnetic Field Topology in Pulsars. *Jonathan Arons.* 408, 160, 85-B1 (1993)
- Magnetic Field Decay from the Core of Neutron Stars: Effects of Interpinning of $^3\text{P}_2$ Neutron Superfluid and $^1\text{S}_0$ Proton Superconducting Fluid. *K. Y. Ding, K. S. Cheng, & H. F. Chau.* 408, 167, 85-B11 (1993)
- Origin and Radio Pulse Properties of Millisecond Pulsars. *Kaiyou Chen & Malvin Ruderman.* 408, 179, 85-C12 (1993)
- Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibasaki, Ken'ichi Nomoto, & Sachiko Tsuruta.* 408, 186, 85-D7 (1993)
- Neutron Star Dynamos and the Origins of Pulsar Magnetism. *Christopher Thompson & Robert C. Duncan.* 408, 194, 85-E4 (1993)
- TeV Gamma Rays from Millisecond Pulsars and the Detectability of Globular Clusters. *I. A. Smith.* 408, 468, 91-A7 (1993)
- Helium Destruction and Gamma-Ray Line Emission in Accreting Neutron Stars. *Lars Bildsten, Edwin E. Salpeter, & Ira Wasserman.* 408, 615, 92-G9 (1993)
- Postglitch Relaxation of the Vela Pulsar after Its First Eight Large Glitches: A Reevaluation with the Vortex Creep Model. *M. Ali Alpar, H. F. Chau, K. S. Cheng, & David Pines.* 409, 345, 101-D1 (1993)
- A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung.* 410, 309, 115-G12 (1993)
- Relativistic Electron-Positron Beams in Gamma-Ray Bursters. *I. A. Smith & Richard I. Epstein.* 410, 315, 116-A6 (1993)
- Disk Plus Halo Models of Gamma-Ray Burst Sources. *I. A. Smith & D. Q. Lamb.* 410, L23, 118-A9 (1993)
- The Binary Pulsar PSR 1908+00 in NGC 6760. *W. T. S. Deich, J. Middleton, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan.* 410, L95, 126-A13 (1993)
- STARS: NOVAE, CATAclysmic VARIABLES**
- Winds from Accretion Disks: Ultraviolet Line Formation in Cataclysmic Variables. *Isaac Shlosman & Peter Vitello.* 409, 372, 101-F1 (1993)
- On the Mass of Nova DQ Herculis (1934). *Keith Horne, William F. Welsh, & Richard A. Wade.* 410, 357, 116-E1 (1993)
- On the Location of the Oscillations in AE Aquarii. *William F. Welsh, Keith Horne, & Richard Gomer.* 410, L39, 118-D1 (1993)
- Ultraviolet Line Diagnostics of Accretion Disk Winds in Cataclysmic Variables. *Peter Vitello & Isaac Shlosman.* 410, 815, 123-G11 (1993)
- A Supersoft Variable Low-Luminosity X-Ray Source in the Globular Cluster M3. *P. Hertz, J. E. Grindlay, & C. D. Bailyn.* 410, L87, 126-A1 (1993)
- STARS: OSCILLATIONS**
- Dynamical Instability as the Cause of the Massive Outbursts in η Carinae and Other Luminous Blue Variables. *Richard B. Stothers & Chao-wen Chin.* 408, L85, 95-C5 (1993)
- On the Location of the Oscillations in AE Aquarii. *William F. Welsh, Keith Horne, & Richard Gomer.* 410, L39, 118-D1 (1993)
- A Provisional RR Lyrae Distance Scale. *Norman R. Simon & Christine M. Clement.* 410, 526, 120-C1 (1993)
- STARS: PLANETARY SYSTEMS**
- Gas and Dust in the Pre-Main-Sequence Multiple System GG Tauri. *D. W. Koerner, A. I. Sargent, & S. V. W. Beckwith.* 408, L93, 95-D7 (1993)
- STARS: POPULATION II**
- The $^6\text{Li}/^7\text{Li}$ Ratio in the Metal-poor Halo Dwarfs HD 19445 and HD 84937. *Verne V. Smith, David L. Lambert, & Poul E. Nissen.* 408, 262, 86-D1 (1993)

STARS: PRE-MAIN-SEQUENCE

- Centrifugally Driven Winds from Protostellar Disks. I. Wind Model and Thermal Structure. *Pedro N. Safier*. 408, 115, 84-E6 (1993)
- Centrifugally Driven Winds from Protostellar Disks. II. Forbidden-Line Emission in T Tauri Stars. *Pedro N. Safier*. 408, 148, 85-A1 (1993)
- Circumstellar Molecular Gas of the HH 34 and HH 111 Exciting Stars. *Karl R. Stapelfeldt & Nicholas Z. Scoville*. 408, 239, 86-B1 (1993)
- Multiplicity and the Ages of the Stars in the Taurus Star-forming Region. *M. Simon, A. M. Ghez, & Ch. Leinert*. 408, L33, 89-B1 (1993)
- A New Herbig-Haro Flow in the HH 1-2 Complex. *Bo Reipurth, Steve Heathcote, M. Roth, A. Noriega-Crespo, & A. C. Raga*. 408, L49, 89-D1 (1993)
- Chemical Differentiation between Star-forming Regions: The Orion Hot Core and Compact Ridge. *P. Caselli, T. I. Hasegawa, & Eric Herbst*. 408, 548, 92-A11 (1993)
- Circularly Polarized Radio Emission from the T Tauri Star Hubble 4. *Stephen L. Skinner*. 408, 660, 93-D6 (1993)
- Near-Infrared Discovery of the L810 Nebula Illuminator. *João Lin Yun, Dan P. Clemens, Mark J. McCaughrean, & Marcia Rieke*. 408, L101, 95-E9 (1993)
- Ice Grains in the Corona Australis Molecular Cloud. *W. P. Chen & J. A. Graham*. 409, 319, 101-A11 (1993)
- Detection of Circumstellar Gas Associated with GG Tauri. *M. F. Skrutskie, R. L. Snell, K. M. Strom, S. E. Strom, S. Edwards, Y. Fukui, A. Mizuno, M. Hayashi, & N. Ohashi*. 409, 422, 102-C1 (1993)
- The Formation and Evolution of Shocks in Stellar Jets from a Variable Wind. *Patrick Hartigan & John Raymond*. 409, 705, 107-G5 (1993)
- The Origin of Forbidden Line Emission from Young Stellar Objects. *Ana I. Gomez de Castro & Ralph E. Pudritz*. 409, 748, 108-D3 (1993)
- An Infrared Survey for Embedded Young Stars in the Perseus Molecular Cloud Complex. *E. F. Ladd, E. A. Lada, & P. C. Myers*. 410, 168, 114-C1 (1993)
- High-Resolution Long-Slit Spectral Imaging of the Mass Outflows in the Immediate Vicinity of DG Tauri. *J. Solf & K. H. Böhm*. 410, L31, 118-F13 (1993)
- Three-dimensional Simulations of Protostellar Jets. *Elisabete M. de Gouveia Dal Pino & Willy Benz*. 410, 686, 122-B13 (1993)
- The Bow Shock and Mach Disk of HH 111V. *Jon A. Morse, Steve Heathcote, Gerald Cecil, Patrick Hartigan, & John C. Raymond*. 410, 764, 123-C5 (1993)
- STARS: PULSARS: GENERAL**
- Magnetic Field Topology in Pulsars. *Jonathan Arons*. 408, 160, 85-B1 (1993)
- Magnetic Field Decay from the Core of Neutron Stars: Effects of Interpinning of $^3\text{P}_2$ Neutron Superfluid and $^1\text{S}_0$ Proton Superconducting Fluid. *K. Y. Ding, K. S. Cheng, & H. F. Chau*. 408, 167, 85-B11 (1993)
- Origin and Radio Pulse Properties of Millisecond Pulsars. *Kaiyou Chen & Malvin Ruderman*. 408, 179, 85-C12 (1993)
- Thermal Evolution of Neutron Stars with Internal Frictional Heating. *Hideyuki Umeda, Noriaki Shibazaki, Ken'ichi Nomoto, & Sachiko Tsuruta*. 408, 186, 85-D7 (1993)
- Neutron Star Dynamos and the Origins of Pulsar Magnetism. *Christopher Thompson & Robert C. Duncan*. 408, 194, 85-E4 (1993)
- Diffuse Gamma-Ray Emission from Pulsars in the Large Magellanic Cloud. *Dieter H. Hartmann, Lawrence E. Brown, & Neil Schnepf*. 408, L13, 88-F8 (1993)
- Low-Mass X-Ray Binaries and Millisecond Pulsars in Globular Clusters. *Kaiyou Chen, John Middleditch, & Malvin Ruderman*. 408, L17, 88-G1 (1993)
- TeV Gamma Rays from Millisecond Pulsars and the Detectability of Globular Clusters. *I. A. Smith*. 408, 468, 91-A7 (1993)
- Deep VLA Imaging of Pulsar-powered Nebulae and the Beaming Properties of Young Pulsars. *Dale A. Frail & David A. Moffett*. 408, 637, 93-B5 (1993)
- A Model of Nonthermal Radiation from Accreting X-Ray Pulsars. *P. P. Leung, K. S. Cheng, & P. C. W. Fung*. 410, 309, 115-G12 (1993)

Angular Broadening of Pulsars and the Distribution of Interstellar Plasma Fluctuations. *C. R. Gwinn, N. Bartel, & J. M. Cordes*. 410, 673, 122-A13 (1993)

STARS: PULSARS: INDIVIDUAL

Name: Centaurus X-3

The Discovery of Pulsed Iron Line Emission from Centaurus X-3. *C. S. R. Day, F. Nagase, K. Asai, & T. Takeshima*. 408, 656, 93-D1 (1993)

Name: Crab Nebula

Observations of the Crab Pulsar and Nebula by the EGRET Telescope on the Compton Gamma-Ray Observatory. *P. L. Nolan, Z. Arzoumanian, D. L. Bertsch, J. Chiang, C. E. Fichtel, J. M. Fierro, R. C. Hartman, S. D. Hunter, G. Kanbach, D. A. Kniffen, P. W. Kwok, Y. C. Lin, J. R. Mattox, H. A. Mayer-Hasselwander, P. F. Michelson, C. von Montigny, H. I. Nel, D. Nice, K. Pinkau, H. Rothenmel, E. Schneid, M. Sommer, P. Sreekumar, J. H. Taylor, & D. J. Thompson*. 409, 697, 107-F8 (1993)

Name: Vela Pulsar

Postglitch Relaxation of the Vela Pulsar after Its First Eight Large Glitches: A Reevaluation with the Vortex Creep Model. *M. Ali Alpar, H. F. Chau, K. S. Cheng, & David Pines*. 409, 345, 101-D1 (1993)

Alphanumeric: 1E 2259+586

High-Frequency Emission of X-Ray Pulsar 1E 2259+586. *V. V. Usov*. 410, 761, 123-C1 (1993)

Alphanumeric: PSR 0540-69

ROSAT Observations of the Large Magellanic Cloud Pulsar PSR 0540-69. *John P. Finley, Hakki Ögelman, Günther Hasinger, & Joachim Trümper*. 410, 323, 116-B1 (1993)

Alphanumeric: PSR 0823+26

Discontinuities in the Dynamic Spectrum of the Pulsar 0823+26. *Andrew W. Clegg, Ralph L. Fiedler, & James M. Cordes*. 409, 691, 107-E13 (1993)

Alphanumeric: PSR 1908+00

The Binary Pulsar PSR 1908+00 in NGC 6760. *W. T. S. Deich, J. Middleditch, S. B. Anderson, S. R. Kulkarni, T. A. Prince, & A. Wolszczan*. 410, L95, 126-A13 (1993)

Alphanumeric: PSR 1919+21

Interstellar Matter near the Pleiades. IV. The Wake of the Pleiades through the Interstellar Medium in Taurus. *Richard E. White & John Bally*. 409, 234, 99-G13 (1993)

Alphanumeric: PSR J1713+0747

A New Binary Millisecond Pulsar. *R. S. Foster, A. Wolszczan, & F. Camilo*. 410, L91, 126-A7 (1993)

Alphanumeric: SMC X-1

Discovery of Orbital Decay in SMC X-1. *A. Levine, S. Rappaport, J. E. Deeter, P. E. Boynton, & F. Nagase*. 410, 328, 116-B8 (1993)

STARS: ROTATION

- Local Hydrodynamic Instability of Rotating Stars. *Alexander Lifschitz & Norman Lebovitz*. 408, 603, 92-F9 (1993)
- Equatorial Disk Formation around Rotating Stars Due to Ram Pressure Confinement by the Stellar Wind. *J. E. Bjorkman & J. P. Cassinelli*. 409, 429, 102-C10 (1993)
- The Evolution of Angular Momentum among Zero-Age Main-Sequence Solar-Type Stars. *David R. Soderblom, John R. Stauffer, Keith B. MacGregor, & Burton F. Jones*. 409, 624, 106-F13 (1993)
- Doppler Imaging Stars with Moderate Rotation: The Spot Distribution on σ Geminorum. *Artie P. Hatzes*. 410, 777, 123-D7 (1993)

STARS: STATISTICS

- Star Counts Redivivus. I. A New Look at the Galaxy at Faint Magnitudes. *Neill Reid & S. R. Majewski*. 409, 635, 106-G12 (1993)
- Reddening Errors and the Post-Main-Sequence Distribution of Stars in the H-R Diagram of the Large Magellanic Cloud. *N. Rathnasree*. 410, L99, 126-B5 (1993)

STARS: SUPERGIANTS

A New Luminous Blue Variable: R143 in 30 Doradus. *Joel Wm. Parker, Geoffrey C. Clayton, Cláudia Winge, & Peter S. Conti*. 409, 770, 108-F3 (1993)

Reddening Errors and the Post-Main-Sequence Distribution of Stars in the H-R Diagram of the Large Magellanic Cloud. *N. Rathnasree*. 410, L99, 126-B5 (1993)

Detection of O I and Si II Far-Infrared Fine-Structure Emission from α Orionis. *Michael R. Haas & Alfred E. Glassgold*. 410, L111, 126-C9 (1993)

STARS: SUPERNOVAE: GENERAL

Magnetic Diffusion Due to Supernova Explosions and Superbubbles in the Galactic Disk. *Katia Ferrière*. 409, 248, 100-C1 (1993)

Stellar Core Collapse: A Boltzmann Treatment of Neutrino-Electron Scattering. *Anthony Mezzacappa & Stephen W. Bruenn*. 410, 740, 123-A7 (1993)

STARS: SUPERNOVAE: INDIVIDUAL

Alphanumeric: SN 1984L

On the Stellar Progenitor of the Type Ib Supernova 1984L. *E. Baron, Timothy R. Young, & David Branch*. 409, 417, 102-B10 (1993)

Alphanumeric: SN 1985F

On the Stellar Progenitor of the Type Ib Supernova 1984L. *E. Baron, Timothy R. Young, & David Branch*. 409, 417, 102-B10 (1993)

Alphanumeric: SN 1987A

High-Resolution Mid-Infrared Spectra of Co II, Ni I, and Fe II in SN 1987A. *D. E. Jennings, R. J. Boyle, G. R. Wiedemann, & S. H. Moseley*. 408, 277, 86-E5 (1993)

The Freeze-out Phase of SN 1987A: Implications for the Light Curve. *Claes Fransson & Cecilia Kozma*. 408, L25, 89-A1 (1993)

Alphanumeric: SN 1990B

The Radio Emission from the Type Ic Supernova SN 1990B. *Schuyler D. Van Dyk, Richard A. Sramek, Kurt W. Weiler, & Nino Panagia*. 409, 162, 99-A3 (1993)

STARS: VARIABLES: OTHER

Miscellaneous

Dynamical Instability as the Cause of the Massive Outbursts in η Carinae and Other Luminous Blue Variables. *Richard B. Stothers & Chao-wen Chin*. 408, L85, 95-C5 (1993)

Luminous Blue Variables

A New Luminous Blue Variable: R143 in 30 Doradus. *Joel Wm. Parker, Geoffrey C. Clayton, Cláudia Winge, & Peter S. Conti*. 409, 770, 108-F3 (1993)

RR Lyrae

A Provisional RR Lyrae Distance Scale. *Norman R. Simon & Christine M. Clement*. 410, 526, 120-C1 (1993)

STARS: WHITE DWARFS

Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman*. 408, L41, 89-C1 (1993)

Unstable Degenerates Revisited. *John Faulkner*. 408, 600, 92-F5 (1993)

JHK Photometry of WD 0950+139. *Michael S. Fulbright & James Liebert*. 410, 275, 115-E1 (1993)

High-Frequency Emission of X-Ray Pulsar 1E 2259+586. *V. V. Usov*. 410, 761, 123-C1 (1993)

The Discovery of Variable Polarization over the 13.9 Minute Spin Period of the Intermediate Polar RE 0751+14. *V. Pirola, P. Hakala, & G. V. Coyne, S.J.* 410, L107, 126-C3 (1993)

The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupuis, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine*. 410, L119, 126-D7 (1993)

STARS: WOLF-RAYET

The Optically Thin C III Spectrum: Line and Multiplet Intensities. *A. K. Bhatia & S. O. Kastner*. 408, 744, 94-D7 (1993)

Polarization Eclipse Model of the Wolf-Rayet Binary V444 Cygni with Constraints on the Stellar Radii and an Estimate of the Wolf-Rayet Mass-Loss Rate. *N. St-Louis, A. F. J. Moffat, L. Lapointe, Yu. S. Efimov, N. M. Shakhovskoy, G. K. Fox, & V. Pirola*. 410, 342, 116-C10 (1993)

Mass Loss from Wolf-Rayet Stars Due to Radiation Pressure and Alfvén Waves. *L. C. dos Santos, V. Jatenco-Pereira, & R. Opher*. 410, 732, 122-G11 (1993)

Hubble Space Telescope Spectra of the Phase-modulated Wind in the SMC O+WR Binary R31. *J. B. Hutchings, L. Bianchi, & S. C. Morris*. 410, 803, 123-F10 (1993)

SUN: ABUNDANCES

Elemental Abundances of Flaring Solar Plasma: Enhanced Neon and Sulfur. *J. T. Schmelz*. 408, 373, 87-G5 (1993)

SUN: ATMOSPHERE

Ionization Effects in Three-dimensional Solar Granulation Simulations. *Mark P. Rast, Åke Nordlund, Robert F. Stein, & Juri Toomre*. 408, L53, 89-D11 (1993)

Observation of Impulsive Acoustic Events and the Excitation of Solar Oscillations. *Sergio R. Restaino, Robin T. Stebbins, & Philip R. Goode*. 408, L57, 89-E9 (1993)

Three-dimensional Structures of Magnetostatic Atmospheres. V. Coupled Electric Current Systems. *B. C. Low*. 408, 689, 93-G1 (1993)

Three-dimensional Structures of Magnetostatic Atmospheres. VI. Examples of Coupled Electric Current Systems. *B. C. Low*. 408, 693, 93-G7 (1993)

SUN: CORONA

Solar Coronal Structure near the Time of the 1991 July 11 Total Solar Eclipse. *D. G. Sime & J. Streete*. 408, 368, 87-F6 (1993)

On the Thermal Stability of a Radiating Plasma Subject to Nonlocal Thermal Conduction. I. Linear Analysis. *E. Chun & R. Rosner*. 408, 678, 93-F1 (1993)

Observed Redshifts in O V and Downflows in the Solar Transition Region. *P. Brekke*. 408, 735, 94-C11 (1993)

Force-free Magnetic Fields with Singular Current-Density Surfaces. *B. C. Low*. 409, 798, 109-A12 (1993)

Oscillations of a Quiescent Solar Prominence Embedded in a Hot Corona. *R. Oliver, J. L. Ballester, A. W. Hood, & E. R. Priest*. 409, 809, 109-B12 (1993)

The Free Energies of Partially Open Coronal Magnetic Fields. *B. C. Low & D. F. Smith*. 410, 412, 117-B10 (1993)

Flux-Tube Divergence, Coronal Heating, and the Solar Wind. *Y.-M. Wang*. 410, L123, 126-D13 (1993)

SUN: FLARES

Elemental Abundances of Flaring Solar Plasma: Enhanced Neon and Sulfur. *J. T. Schmelz*. 408, 373, 87-G5 (1993)

Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer*. 409, 465, 102-F9 (1993)

Evidence for a Fundamental Period of the Sun and Its Relation to the 154 Day Complex of Periodicities. *T. Bai & P. A. Sturrock*. 409, 476, 102-G8 (1993)

Magnetic Field Power Density Spectra during "Scatter-free" Solar Particle Events. *L. C. Tan & G. M. Mason*. 409, L29, 104-E1 (1993)

Solar Neutron and Proton Production during the 1990 May 24 Cosmic-Ray Flare Increases. *H. Debrunner, J. A. Lockwood, & J. M. Ryan*. 409, 822, 109-D1 (1993)

Evidence for a Spatially Extended Component of Gamma Rays from Solar Flares. *W. Thomas Vestrand & David J. Forrest*. 409, L69, 111-F8 (1993)

SUN: FUNDAMENTAL PARAMETERS

Evidence for a Fundamental Period of the Sun and Its Relation to the 154 Day Complex of Periodicities. *T. Bai & P. A. Sturrock*. 409, 476, 102-G8 (1993)

SUN: GENERAL

g-Modes and the Solar Neutrino Problem. *John N. Bahcall & Pawan Kumar*. 409, L73, 111-G1 (1993)

SUN: INTERIOR

Toward a Unified Classical Model of the Sun: On the Sensitivity of Neutrinos and Helioseismology to the Microscopic Physics. *Sylvaine Turck-Chièze & Ildio Lopes*. 408, 347, 87-D10 (1993)

A Solar Dynamo Surface Wave at the Interface between Convection and Nonuniform Rotation. *E. N. Parker*. 408, 707, 94-A9 (1993)

Evidence for a Fundamental Period of the Sun and Its Relation to the 154 Day Complex of Periodicities. *T. Bai & P. A. Sturrock*. 409, 476, 102-G8 (1993)

1 Sun: Interior-Turbulence

g-Modes and the Solar Neutrino Problem. *John N. Bahcall & Pawan Kumar.* 409, L73, 111-G1 (1993)

SUN: MAGNETIC FIELDS

Three-dimensional Structures of Magnetostatic Atmospheres. V. Coupled Electric Current Systems. *B. C. Low.* 408, 689, 93-G1 (1993)

Three-dimensional Structures of Magnetostatic Atmospheres. VI. Examples of Coupled Electric Current Systems. *B. C. Low.* 408, 693, 93-G7 (1993)

The Free Energies of Partially Open Coronal Magnetic Fields. *B. C. Low & D. F. Smith.* 410, 412, 117-B10 (1993)

Flux-Tube Divergence, Coronal Heating, and the Solar Wind. *Y.-M. Wang.* 410, L123, 126-D13 (1993)

SUN: OSCILLATIONS

Observation of Impulsive Acoustic Events and the Excitation of Solar Oscillations. *Sergio R. Restaino, Robin T. Stebbins, & Philip R. Goode.* 408, L57, 89-E9 (1993)

The Cutoff Frequency for Fast-Mode Magnetohydrodynamic Waves in an Isothermal Atmosphere with a Uniform Horizontal Magnetic Field. *B. A. Stark & Z. E. Musielak.* 409, 450, 102-E5 (1993)

Asymptotic Theory of Intermediate- and High-Degree Solar Acoustic Oscillations. *M. Brodsky & S. V. Vorontsov.* 409, 455, 102-E11 (1993)

Oscillations of a Quiescent Solar Prominence Embedded in a Hot Corona. *R. Oliver, J. L. Ballester, A. W. Hood, & E. R. Priest.* 409, 809, 109-B12 (1993)

g-Modes and the Solar Neutrino Problem. *John N. Bahcall & Pawan Kumar.* 409, L73, 111-G1 (1993)

Asymmetries of Solar Oscillation Line Profiles. *T. L. Duvall, Jr., S. M. Jefferies, J. W. Harvey, Y. Osaki, & M. A. Pomerantz.* 410, 829, 124-A13 (1993)

SUN: PARTICLE EMISSION

Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer.* 409, 465, 102-F9 (1993)

Magnetic Field Power Density Spectra during "Scatter-free" Solar Particle Events. *L. C. Tan & G. M. Mason.* 409, L29, 104-E1 (1993)

Solar Neutron and Proton Production during the 1990 May 24 Cosmic-Ray Flare Increases. *H. Debrunner, J. A. Lockwood, & J. M. Ryan.* 409, 822, 109-D1 (1993)

The Free Energies of Partially Open Coronal Magnetic Fields. *B. C. Low & D. F. Smith.* 410, 412, 117-B10 (1993)

SUN: PROMINENCES

Three-dimensional Structures of Magnetostatic Atmospheres. VI. Examples of Coupled Electric Current Systems. *B. C. Low.* 408, 693, 93-G7 (1993)

Force-free Magnetic Fields with Singular Current-Density Surfaces. *B. C. Low.* 409, 798, 109-A12 (1993)

Oscillations of a Quiescent Solar Prominence Embedded in a Hot Corona. *R. Oliver, J. L. Ballester, A. W. Hood, & E. R. Priest.* 409, 809, 109-B12 (1993)

SUN: RADIO RADIATION

Dynamics of Langmuir and Ion-Sound Waves in Type III Solar Radio Sources. *P. A. Robinson, A. J. Willes, & I. H. Cairns.* 408, 720, 94-B9 (1993)

Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer.* 409, 465, 102-F9 (1993)

SUN: ROTATION

A Solar Dynamo Surface Wave at the Interface between Convection and Nonuniform Rotation. *E. N. Parker.* 408, 707, 94-A9 (1993)

SUN: SOLAR WIND

Dynamics of Langmuir and Ion-Sound Waves in Type III Solar Radio Sources. *P. A. Robinson, A. J. Willes, & I. H. Cairns.* 408, 720, 94-B9 (1993)

Flux-Tube Divergence, Coronal Heating, and the Solar Wind. *Y.-M. Wang.* 410, L123, 126-D13 (1993)

SUN: TRANSITION REGION

Observed Redshifts in O V and Downflows in the Solar Transition Region. *P. Brekke.* 408, 735, 94-C11 (1993)

SUN: UV RADIATION

Observed Redshifts in O V and Downflows in the Solar Transition Region. *P. Brekke.* 408, 735, 94-C11 (1993)

SUN: X-RAYS, GAMMA RAYS

Lower Hybrid Resonance Acceleration of Electrons and Ions in Solar Flares and the Associated Microwave Emission. *K. G. McClements, R. Bingham, J. J. Su, J. M. Dawson, & D. S. Spicer.* 409, 465, 102-F9 (1993)

Evidence for a Spatially Extended Component of Gamma Rays from Solar Flares. *W. Thomas Vestrand & David J. Forrest.* 409, L69, 111-F8 (1993)

SURVEYS

Far-Ultraviolet Stellar Photometry: A Field in Monoceros. *Edward G. Schmidt & George R. Carruthers.* 408, 484, 91-C1 (1993)

A Highly Sensitive Radio Survey of Symbiotic Stars at 3.6 Centimeters. *E. R. Seaquist, M. Krogulec, & A. R. Taylor.* 410, 260, 115-C12 (1993)

TECHNIQUES: IMAGE PROCESSING

The First Detection of a Collapsed Core Globular Cluster in M31. *O. Bendinelli, C. Cacciari, S. Djorgovski, L. Federici, F. R. Ferraro, F. Fusi Pecci, G. Parmeggiani, N. Weir, & F. Zavatti.* 409, L17, 104-C7 (1993)

TECHNIQUES: INTERFEROMETRIC

VLBI Observations of a Complete Sample of Radio Galaxies. II. The Parsec-Scale Structure of NGC 315. *T. Venturi, G. Giovannini, L. Feretti, G. Comoretto, & A. E. Wehrle.* 408, 81, 84-B4 (1993)

Imaging with Ultra-Resolution in the Presence of Strong Scattering. *T. J. Cornwell & Ramesh Narayan.* 408, L68, 89-G1 (1993)

VLBI Observations of a Complete Sample of Radio Galaxies. III. The Two-sided Milliarsecond Structure of 3C 338. *L. Feretti, G. Comoretto, G. Giovannini, T. Venturi, & A. E. Wehrle.* 408, 446, 90-F7 (1993)

Detection of Magnetohydrodynamic Shocks in the L1551 Outflow. *M. Barsony, N. Z. Scoville, & C. J. Chandler.* 409, 275, 100-E4 (1993)

Angular Broadening of Pulsars and the Distribution of Interstellar Plasma Fluctuations. *C. R. Gwinn, N. Bartel, & J. M. Cordes.* 410, 673, 122-A13 (1993)

VLBI Astrometric Identification of the Radio-emitting Region in Algol and Determination of the Orientation of the Close Binary. *Jean-François Lestrade, Robert B. Phillips, Mark W. Hodges, & Robert A. Preston.* 410, 808, 123-G1 (1993)

TECHNIQUES: PHOTOMETRIC

Far-Ultraviolet Stellar Photometry: A Field in Monoceros. *Edward G. Schmidt & George R. Carruthers.* 408, 484, 91-C1 (1993)

Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560. *A. G. Michaliosianos, M. Perez, S. N. Shore, S. P. Maran, M. Karovska, G. Sonneborn, J. R. Webb, Thomas G. Barnes III, Marian L. Frueh, R. J. Oliveren, & S. G. Starrfield.* 409, L53, 111-D8 (1993)

TECHNIQUES: RADIAL VELOCITIES

Mapping Spherical Potentials with Discrete Radial Velocities. *David Merritt & Prasenjit Saha.* 409, 75, 97-G10 (1993)

TECHNIQUES: SPECTROSCOPIC

High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmond, K. Ito, & M. H. Stevens.* 410, 837, 124-B8 (1993)

TELESCOPES

Imaging with Ultra-Resolution in the Presence of Strong Scattering. *T. J. Cornwell & Ramesh Narayan.* 408, L68, 89-G1 (1993)

TURBULENCE

Cosmic Turbulence Revisited. *I. Goldman & V. M. Canuto.* 409, 495, 105-B1 (1993)

A Similarity Solution to the Kinematic $\alpha^2\omega$ Dynamo Equation with Time-dependent Coefficients. *Chung-Ming Ko.* 410, 128, 113-F8 (1993)

ULTRAVIOLET: GALAXIES

- Multifrequency Observations of the Optically Active Radio-quiet Quasar GQ Comae. II. Ultraviolet, Optical, and Infrared Continuum Variability. *Michael L. Siiko, Annamaria K. Siiko, Aneta Siemiginowska, & R. Szczerba.* 409, 139, 98-F5 (1993)
- The Narrow-Line Region of High-Luminosity Active Galactic Nuclei. *Beverly J. Wills, H. Netzer, M. S. Brotherton, Mingsheng Han, D. Wills, J. A. Baldwin, G. J. Ferland, & I. W. A. Browne.* 410, 534, 120-C11 (1993)

ULTRAVIOLET: GENERAL

- High-Resolution Absorption Cross Section Measurements of Carbon Monoxide at 20 K between 96.7 and 98.8 Nanometers. *G. Stark, K. Yoshino, P. L. Smith, J. R. Esmond, K. Ito, & M. H. Stevens.* 410, 837, 124-B8 (1993)

ULTRAVIOLET: INTERSTELLAR

- A Catalog of Stellar Lyman-Alpha Fluxes. *Wayne Landsman & Theodore Simon.* 408, 305, 87-A1 (1993)
- Radiative Lifetimes, Branching Ratios, and Absolute Transition Probabilities in Cr II and Zn II. *S. D. Bergeson & J. E. Lawler.* 408, 382, 88-A3 (1993)
- Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman.* 408, L41, 89-C1 (1993)
- Neutrino Decay and the Heat Budget of the Warm Interstellar Medium. *D. W. Sciana.* 409, L25, 104-D9 (1993)
- Voyager 2 Observations of NGC 7023: Dust Scattering Shortward of 1600 Å. *A. N. Witt, J. K. Petersohn, J. B. Holberg, J. Murthy, A. Dring, & R. C. Henry.* 410, 714, 122-E13 (1993)

ULTRAVIOLET: SOLAR SYSTEM

- The OH Distribution in Cometary Atmospheres: A Collisional Monte Carlo Model for Heavy Species. *Michael R. Combi, Brent J. Bos, & William H. Smyth.* 408, 668, 93-E1 (1993)

ULTRAVIOLET: STARS

- A Catalog of Stellar Lyman-Alpha Fluxes. *Wayne Landsman & Theodore Simon.* 408, 305, 87-A1 (1993)
- Dynamic Processes in Be Star Atmospheres. I. "Dimple" Formation in the He sci $\lambda 6678$ Line of λ Eridani. *Myron A. Smith & Ronald S. Polidan.* 408, 323, 87-B8 (1993)
- Extreme Ultraviolet Observations of HZ 43 and the Local H/He Ratio with the Hopkins Ultraviolet Telescope. *Randy A. Kimble, Arthur F. Davidsen, Knox S. Long, & Paul D. Feldman.* 408, L41, 89-C1 (1993)
- Far-Ultraviolet Stellar Photometry: A Field in Monoceros. *Edward G. Schmidt & George R. Carruthers.* 408, 484, 91-C1 (1993)
- Effective Collision Strengths for O II. *Brendan M. McLaughlin & Kenneth L. Bell.* 408, 753, 94-E3 (1993)
- Hopkins Ultraviolet Telescope Observations of Far-Ultraviolet Scattering in NGC 7023: The Dust Albedo. *Jayant Murthy, Andrew Dring, Richard C. Henry, Jeffrey W. Kruk, William P. Blair, Randy A. Kimble, & Samuel T. Durrance.* 408, L97, 95-E3 (1993)
- Composition of Interstellar Clouds in the Disk and Halo. I. HD 93521. *Lyman Spitzer, Jr., & Edward L. Fitzpatrick.* 409, 299, 100-G3 (1993)
- Ultraviolet Continuum Variability and Visual Flickering in the Peculiar Object MWC 560. *A. G. Michalissianos, M. Perez, S. N. Shore, S. P. Maran, M. Karovska, G. Sonneborn, J. R. Webb, Thomas G. Barnes III, Marian L. Frueh, R. J. Oliveren, & S. G. Starrfield.* 409, L53, 111-D8 (1993)
- Ultraviolet Properties of Individual Hot Stars in Globular Cluster Cores. I. NGC 1904 (M79). *B. Altner & T. A. Matlsky.* 410, 116, 113-E8 (1993)
- Hubble Space Telescope Spectra of the Phase-modulated Wind in the SMC O+WR Binary R31. *J. B. Hutchings, L. Bianchi, & S. C. Morris.* 410, 803, 123-F10 (1993)
- Ultraviolet Line Diagnostics of Accretion Disk Winds in Cataclysmic Variables. *Peter Vitello & Isaac Shlosman.* 410, 815, 123-G11 (1993)
- The First Detection of Ionized Helium in the Local ISM: EUVE and IUE Spectroscopy of the Hot DA Dwarf GD 246. *Stéphane Vennes, Jean Dupois, Todd Rumph, Jeremy Drake, Stuart Bowyer, Pierre Chayer, & Gilles Fontaine.* 410, L119, 126-D7 (1993)

X-RAYS: GALAXIES

- X-Ray Spectra of 12 Distant Clusters of Galaxies. *Qingde Wang & John T. Stocke.* 408, 71, 84-A4 (1993)
- A Spectral Study of Four X-Ray-selected BL Lacertae Objects with EXOSAT. *R. M. Sambruna, P. Barr, L. Maraschi, G. Tagliaferri, & A. Treves.* 408, 452, 90-G1 (1993)
- X-Ray Evidence for Seyfert Activity Buried in the Infrared Galaxy NGC 4945. *K. Iwasawa, K. Koyama, H. Awaki, H. Kunieda, K. Makishima, T. Tsuru, T. Ohashi, & N. Nakai.* 409, 155, 98-G9 (1993)
- Features of the Fluorescent Iron Line from Highly Inclined Disks: Some Possible Examples for NGC 6814. *G. Bao.* 409, L41, 111-C1 (1993)
- Discovery of a New Component in the Gravitationally Lensed Quasar 0957+561. *C. Jones, C. Stern, E. Falco, W. Forman, L. David, I. Shapiro, & A. C. Fabian.* 410, 21, 112-D1 (1993)
- Quasar X-Ray Spectra Revisited. *P. Shastri, B. J. Wilkes, M. Elvis, & J. McDowell.* 410, 29, 112-D11 (1993)
- Self-absorbed Active Galactic Nuclei and the Cosmic X-Ray Background. *Piero Madau, Gabriele Ghisellini, & A. C. Fabian.* 410, L7, 117-F8 (1993)
- High-Resolution X-Ray Observations of the Central Region of M31 with the ROSAT Satellite. *F. A. Primini, W. Forman, & C. Jones.* 410, 615, 121-C12 (1993)

X-RAYS: GENERAL

- High-Resolution Measurements, Line Identification, and Spectral Modeling of K α Transitions in Fe XVIII-Fe XXV. *P. Beiersdorfer, T. Phillips, V. L. Jacobs, K. W. Hill, M. Bitter, S. von Goeler, & S. M. Kahn.* 409, 846, 109-F6 (1993)
- On the Origin of the Soft X-Ray Background. *Q. Daniel Wang & Richard McCray.* 409, L37, 111-B8 (1993)

X-RAYS: INTERSTELLAR

- An Observation of the Galactic Center Hard X-Ray Source, 1E 1740.7-2942, with the Caltech Coded-Aperture Telescope. *William A. Heindl, Walter R. Cook, John M. Grunsfeld, David M. Palmer, Thomas A. Prince, Stephen M. Schindler, & Edward C. Stone.* 408, 507, 91-E7 (1993)
- The X-Ray Shadow of the High-Latitude Molecular Cloud MBM 12. *S. L. Snowden, D. McCammon, & F. Verter.* 409, L21, 104-D1 (1993)
- Radio and X-Ray Observations of OH 231.8+4.2. *Gregory B. Taylor & Mark Morris.* 409, 720, 108-A9 (1993)
- X-RAYS: STARS**
- The Secondary Maxima in Black Hole X-Ray Nova Light Curves: Clues toward a Complete Picture. *Wan Chen, Mario Livio, & Neil Gehrels.* 408, L5, 88-E8 (1993)
- Low-Mass X-Ray Binaries and Millisecond Pulsars in Globular Clusters. *Kaiyou Chen, John Middleliech, & Malvin Ruderman.* 408, L17, 88-G1 (1993)
- Optical and X-Ray Observations of the Low-Mass X-Ray Binary EXO 0748-676. *Brian Thomas, Robin Corbet, Thomas Augusteijn, Paul Callanan, & Alan P. Smale.* 408, 651, 93-C7 (1993)
- The Discovery of Pulsed Iron Line Emission from Centaurus X-3. *C. S. R. Day, F. Nagase, K. Asai, & T. Takeshima.* 408, 656, 93-D1 (1993)
- Hydrodynamics of Winds from Irradiated Companion Stars in Low-Mass X-Ray Binaries. *Marco Tavani & Richard London.* 410, 281, 115-E8 (1993)
- ROSAT Observations of the Large Magellanic Cloud Pulsar PSR 0540-69. *John P. Finley, Hakkı Ögelman, Günther Hasinger, & Joachim Trümper.* 410, 323, 116-B1 (1993)
- Discovery of Orbital Decay in SMC X-1. *A. Levine, S. Rappaport, J. E. Deeter, P. E. Boynton, & F. Nagase.* 410, 328, 116-B8 (1993)
- Stellar Coronae at the End of the Main Sequence: A ROSAT Survey of the Late M Dwarfs. *Thomas A. Fleming, Mark S. Giampapa, J. H. M. M. Schmitt, & Jay A. Bookbinder.* 410, 387, 116-G8 (1993)
- High-Frequency Emission of X-Ray Pulsar 1E 2259+586. *V. V. Usov.* 410, 761, 123-C1 (1993)
- Resolving the Iron K Line in Cygnus X-2: An Observation with BBXRT. *A. P. Smale, C. Done, R. F. Mushotsky, K. A. Weaver, P. J. Serlemitsos, F. E. Marshall, R. Petre, K. M. Jahoda, E. A. Boldt, J. H.*

iii X-Rays: Stars—X-Rays: Stars

Swank, A. E. Szymkowiak, R. L. Kelley, & K. Arnaud. 410, 796,
123-F1 (1993)
A Supersoft Variable Low-Luminosity X-Ray Source in the Globular
Cluster M3. *P. Hertz, J. E. Grindlay, & C. D. Bailyn.* 410, L87,

126-A1 (1993)
Discovery of Multiple Low-Luminosity X-Ray Sources in NGC 6397.
*Adrienne M. Cool, Jonathan E. Grindlay, Martin Krockenberger, &
Charles D. Bailyn.* 410, L103, 126-B11 (1993)

